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COMPUTERWORLD

Software pricing sizzles

Novell dangles bargain bait before NetWare users

By Laura DiDio

Novell, Inc. last week offered NetWare 2.x and 3.x users two more inducements to accelerate their migration to NetWare 4.1. The company slashed upgrade pricing by 20% and added a one-day training session for the cut-rate price of $49 instead of the usual $400.



The latest moves mark the third time in the past eight months that the Provo, Utah-based vendor has reduced upgrade costs for users migrating from the older NetWare environments to NetWare 4.1, said Ladd Timpson, Novell's director of market development in the operating systems division. Customers who purchase a 250-user site license at a list price of $3,996, for instance, will save $800, or $32 per user.

This latest promotion is good from now until Oct. 31. For the same period, Novell is offering a similar 20% discount for all users who want to upgrade from WordPerfect Office to Novell's GroupWise 4.1.

For users such as Daniel Schuffert, a senior systems programmer at Stone Container Corp., the incentives are nice but hardly compelling enough to

Novell, *page 16*

Microsoft discounts Office 95 suite for early birds

By Cheryl Gerber and Lisa Picarille

Microsoft Corp. today will fire off the first in a series of aggressive pricing and marketing programs for the Windows 95 version of its Office suite, a move expected to spark similar pricing initiatives among the leading desktop suite vendors.

Some observers lauded those programs as a sign that Microsoft is starting to take the needs of IS into serious account. One high-level banking customer of Microsoft's, for example, said last week that he has seen much greater willingness from the vendor in the past several months to alter its pricing policies to keep corporate accounts happy.

Along with introductory discounts for Office 95 retailers and resellers, Microsoft will announce licensing discounts of approximately 20% for corporate users who migrate early to the 32-bit operating system and application platform. This marks the first time Microsoft has offered the same discounts directly to its corporate customers that it extends to resellers and retailers.

The incentive comes at a time when some resellers, vendors and users are predicting a slow migration to Windows 95 in corporate accounts [CW, July 3].

Microsoft also said last week that it

Microsoft, *page 125*

Drug errors heighten need for IS Rx

The study found that even after 30 years of effort, most hospitals have only rudimentary systems for collecting and retrieving clinical information," and few can present that information in a way that helps patients

Systems exist, but can hospitals afford them?

By Mitch Betts

information systems in many of the nation's hospitals lag far behind the systems used by banks, airlines and even grocery stores. In fact, a study released last week said hospital systems are so primitive that doctors lack access to the critical information they need to make sure patients get the right drugs at the right doses.

The study in the *Journal of the American Medical Association* made a strong pitch for computerized drug order-entry systems, which can guide doctors in selecting the best drug in the appropriate dose. Such systems also provide safeguards against dangerous drug reactions.

The Harvard University-led study found that 6.5% of hospital patients suffer from medication errors, many of them deemed serious or life-threatening. The problem attracted national attention earlier this year after Boston's prestigious Dana-Farber Cancer Institute admitted giving a lethal dose of a chemotherapy drug to a

Drug errors, *page 125*

Life support

Health care experts cited the following stumbling blocks to using technology to prevent medication snafus:

- **Substantial cost in an era of downsizing and budget cuts.**
- **Doctors' resistance to automation.**
- **Difficulties replacing legacy systems.**
- **Software vendors that focus more on accounting systems than on medical support.**

SUMMER Better Than Others

Today they are among the most successful IS chiefs in the industry, but they were once medical illustrators, camp counselors and software developers. IS veterans describe the long-ago summer jobs that helped them get where they are today. See Careers, page 100.

DANIEL VASCONCELLOS

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Data mining unearths customers



Save a forest

Bank of America's massive data warehousing system is said to be one of the largest in use worldwide. Making a paper copy of its 800G bytes of data would require roughly 34,000 trees.

By Thomas Hoffman and Kim S. Nash
SAN FRANCISCO

When Robert Menicucci boots up his PC this morning, he may want to find out just how many of the 6,000 Silicon Valley residents in his sales district own Acura Legends and golf club memberships.

And the senior vice president of Bank of America can do just that — within seconds. Menicucci and his sales team can now sculpt detailed demographic views of the banking habits and financial assets of select groups of Bank of America customers.

Once armed with the data, the team can tailor-make its pitch for remortgage loans and other financial products. Other bank employees can use the customer service application in a similar way.

The application, which will be rolled out to all 35 Bank of America district managers by the end of the year, was made possible by the bank's 9-year-old

Data mining, *page 28*

Then and now

Rapid growth of Bank of America's data warehouse now allows 1,200 users to tap its resources daily

1986	1995
15G bytes	800G bytes
30 MIPS	1,800 MIPS
20 parallel processors	102 parallel processors
5 queries per day	2,000 queries per day
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July 10, 1995

What's Inside

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This CIO is a CAMPUS RADICAL

If Lew Temares, the aggressive CIO/dean at the University of Miami, succeeds in his turnaround mission, he'll show higher education how to break out of the death spiral of rising costs and declining admissions.

See how Temares' all-out re-engineering campaign is faring in **Management**, *page 81*.

■ **Symantec buys Delrina.** Both are big on Windows 95, so it should be a good combo, though the operating system itself will contain aspects of the products **NEWS**, *page 4*

■ IBM this week will introduce a **lower-cost replacement for its aging 3745** front-end processor that should finally make it feasible for mainframe shops to start migrating their networks toward the computer giant's peer-to-peer update of SNA. **NEWS**, *page 6*

■ **Proginet and Microsoft introduce file transfer software** to allow LANs equipped with BackOffice to communicate with MVS hosts. **NEWS**, *page 8*



■ Data General rolls out a **new entry-level RAID product** for Unix and PC servers, joining EMC and others attacking the increasingly crowded client/server storage systems market. **NEWS**, *page 10*

■ A standard for **analog simultaneous voice/data communications** — a poor man's multimedia conferencing — is in the offing as vendors prepare modified modems. **NEWS**, *page 12*

■ **While industry observers are soaring on the much-vaunted CDPD wireless data transfer protocol**, CDPD backers believe the technology is finally living up to its promise. **NEWS**, *page 14*

■ This month, **Minnesota's Pollution Control Agency will begin processing permit requests electronically**, using the first of several client/server applications developed under an $8.6 million automation initiative. **DESKTOP COMPUTING**, *page 42*

■ **First Union tightens up security** on its trading floor. **WORKGROUP COMPUTING**, *page 47*

■ **Chipcom ships a management application** that lets users monitor and manage its nascent ATM systems and modules down to the port level as well as on-demand ATM virtual circuits. **ENTERPRISE NETWORKING**, *page 57*



■ **IBM and Computer Associates** are leading the move toward integrated client/server storage management, but they are approaching that challenge from very different angles. **LARGE SYSTEMS**, *page 70*



■ **Relational database makers** tackle the data warehousing question in vastly different ways **APPLICATION DEVELOPMENT**, *page 75*

■ **The newest version of DataEase 5 for Windows** has some quirks, but it also boasts a powerful development language **APPLICATION DEVELOPMENT**, *page 75*

■ **Leilani Allen** reviews new books by Michael Schrage and James L. Mckenney. **MANAGEMENT**, *page 88*

■ Hippo dances, Web belly laughs and predictions from **Paul Gillin** **EDITORIAL**, *page 36*

■ **Harris N. Miller** argues that xenophobic immigration reforms will turn away talented programmers and make the U.S. less competitive. **VIEWPOINT**, *page 37*

■ **Chris Miksanek** explains why it's better to be the software than the software engineer **VIEWPOINT**, *page 37*

■ IBM and Lotus in combination can turn the tables on Microsoft, if they move quickly, **Jeffrey Henning** says **DESKTOP COMPUTING**, *page 42*

■ Darwinism, which predicts survival of the fittest, threatens to put a crimp in vendors' plans to field all manner of hardware and software commodity platforms in 1995 and 1996, **Jean Bozman** says **WORKGROUP COMPUTING**, *page 49*

■ **Charles Babcock** examines how technology can speed up justice while having a positive impact on the community. **COMMENTARY**, *page 126*



THE SCHOOL OF HARD KNOCKS

If you don't make client/server training relevant to real-world apps and use new skills right away, then the training has been a waste, say IS staffers such as Linda Smith, a project leader at Sprint (*left*). See In Depth, page 97.

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Executive Briefing

Compaq and Oracle are teaming up to provide a systems management suite this fall. The announcement is part of a broader push by Compaq to provide database servers and application servers for the enterprise client/server market. *Page 4*. Meanwhile, an **alliance between NEC and Packard Bell** could give the latter some much-needed funds, and **IBM makes some progress** on a talking-head interface for its desktop machines. *Pages 32 and 41*

Apple scales back its efforts to license its Mac OS as the company re-evaluates other ways to increase its dwindling market share. The road to the **Common Hardware Reference Platform** is full of speed bumps, leaving users considering alternate routes. *Pages 12, 41*

On the 'net: Three big providers link their Internet backbones; FreeMark unveils a **free E-mail service** that will require users to wade through ads; tools and techniques help corporations **track the effectiveness of their Web sites**. *Pages 15, 57 and 58*. Also, just about any company can become an Internet access provider. Choose your service carefully. *Page 114*

In addition to cutting upgrade prices on NetWare 4.1 for the third time this year, a **Novell executive discloses enhancements to NetWare Management Services** for a fall update of the ManageWise package — and **users are increasingly frustrated with Microsoft and Novell not working with each other**. *Pages 1 and 6*. Also, **Novell combines two units** — the NetWare Systems Group and Unix Systems Group — into a single entity called the Novell Systems Group and **introduces NetWare Connect 2**, a remote access platform to let remote PC and Macintosh users access all network services. Finally, **Novell's long-awaited NetWare client requester** for Windows NT workstations is at long last available — but there are some caveats about downloading it from CompuServe. *Page 47*

Big iron/little iron. Integrated Computing Engines is putting the finishing touches on a **desktop workstation that it claims has supercomputing** number-crunching capabilities. **Unisys is pinning much of its hopes** for a turnaround on OPUS, the company's parallel processing server that was unveiled in April. **Clustering technology has come to the AS/400** in the form of a high-speed interconnect for sharing databases among systems. But several early users warned that the OptiConnect product has required additional hardware, consulting contracts and the patience to deal with some bugs. *Pages 32, 67 and 70*

Cigna appoints a chief technology officer to head up a newly created R&D group within IS. *Page 20*

The 5th Wave *by* Rich Tennant





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Compaq to 'precook' server

Systems management suite targets non-IS users

By Jean S. Bozman and Jaikumar Vijayan

Compaq Computer Corp. and Oracle Corp. are teaming up to provide a systems management suite this fall that will enable information systems staff to configure far-flung servers, Oracle confirmed last week.

The announcement will focus on an integrated hardware and software package that allows users to manage a mixed network of distributed Microsoft Corp. Windows NT and Unix database servers through a Windows console interface designed by the Redwood Shores, Calif.-based Oracle.

Users at large sites with distributed database servers said a high level of PC server integration is necessary to compensate for a lack of IS expertise in business unit workgroups.

"I think the hardware vendors are going to deliver a plug-and-play box because there are not that many [IS] people with the expertise to make that [integration] work," said Deanis Walsh, chief information officer at Entergy Corp., a $6 billion energy conglomerate in New Orleans. Entergy buys prepackaged PC servers from Dell Computer Corp., with Microsoft's NT and Access database. Entergy IS staffers configure some Dell units with SunSoft's Solaris Unix operating system, Walsh said.

For Houston-based Compaq, the move represents an integral part of its push to differentiate its PC server offerings from those of rivals such as Hewlett-Packard Co. and Dell, industry analysts said.

> **Compaq will essentially "precook your server for you. For the person who doesn't know how to do it, installing all the [database and application] software on a server is ugly."**
>
> — Cheryl Currid, president, Currid & Co.

Man the BattleStar

Oracle managers said the database company's BattleStar console and software agents will be used to manage mixed networks of Compaq servers used in branch offices where few IS personnel are available. Among the target sites are remote retail locations or replicated banking branches, said Bonnie Crater, senior director of Oracle's Compaq Products Division.

For some Compaq users, Microsoft's NT operating system, SQL Server database and BackOffice integrated office suite will comprise their main enterprise solution, analysts said. But for others — particularly those in companies with large Unix-centric open systems networks — Compaq hardware will run Unix operating systems and Oracle databases, analysts said.

Compaq will essentially "precook your server for you," said Cheryl Currid, president of Currid & Co., a Houston consultancy. "For the person who doesn't know how to do it, installing all the [database and application] software on a server is ugly."

When pitted against the rival BackOffice suite of products, packaging will become key to the success of the Compaq/Oracle enterprise servers. "You want to have some confidence that it's going to be a smooth fit," said Tony Iams, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Microsoft has built that confidence with BackOffice."

Working together

Compaq and Oracle's initial announcement "will be in terms of cooperative marketing," said Thomas Kucharvy, president of Summit Strategies, Inc. in Boston. He said the pivotal elements would be the use of NT, Oracle databases and applications software from SAP America, Inc.

Also last week, SunSoft, Oracle and Compaq executives confirmed that Sun Microsystems, Inc. is negotiating a deal with Compaq to support Solaris on Compaq's enterprise server machines. That combination of products is already being sold by Sun reseller Access Graphics, Inc. in Boulder, Colo.

Tax debate roils IS freelancers

By Craig Stedman

The long-simmering issue of whether hired-gun information systems workers are independent contractors or company employees boiled over again last week when IBM confirmed that the Internal Revenue Service is auditing its past payments to freelancers.

The high-profile audit — which could cost IBM up to $4 million in tax liabilities — came to light just a week after a bill was filed in Congress that would simplify the process of determining whether a contractor must be classified as a regular employee for tax purposes. Computer lawyers said an existing set of 20 common law rules used by the IRS are far too ambiguous, especially for technical workers.

"The rules are antiquated, and the way the IRS applies them doesn't match the way technical people work," said Esther Roditti, a New York attorney who publishes the "Computer Law and Tax Report" newsletter. For example, a person working for just one client at a time and using equipment the client provides is typically classified by the IRS as an employee of that company, she said.

According to the IRS, some of the criteria that qualify a worker as an employee include:

- Works full time for one company
- Works at employer's facilities
- Complies with employer's directions about the work
- Receives training from employer
- Has no profit or loss potential from services
- May quit without liability

IBM is the most visible target the IRS has gone after for not withholding income and Social Security taxes from the paychecks of freelancers. But other companies have good reason to be concerned about the move, Roditti and others said.

"It's a bigger issue than IBM, and I think it's going to become hotter as [the new bill] is pushed through Congress," said Harvey Shulman, general counsel at the National Association of Computer Consultant Businesses, a Washington-based organization of 250 consulting firms.

Shulman has been involved in 30 technology-related audits in recent years. "Even if you win the audit, it takes several months to several years and a lot of money," he noted.

In IBM's case, the IRS audit covers independent contractors hired between 1986 and 1992. Officials would not specify the number of contractors involved or the potential tax liability, but sources familiar with the audit put the latter figure at between $3 million and $4 million.

@ Talkback@cw.com

What do you think of IBM's troubles with the IRS over freelance contractors? Sound off to us at talkback@cw.com. Please include your full name. We'll publish a sampling of reader opinions in an upcoming issue.

Symantec bid for Delrina highlights plans for Windows 95 mobile users

Combined firms would leverage communications, network software

By Tim Ouellette

Two companies that have tied their futures to Windows 95 have now tied their organizations together.

Symantec Corp. announced last week that it will place $415 million on the table to purchase Delrina Corp. Symantec, based in Cupertino, Calif., is known for its popular Norton Utilities product line and its network management software; Toronto-based Delrina produces fax, communications and forms management software.

"This is certainly doubling down on our Win 95 investment," said Gordon Eubanks, chief executive officer at Symantec. Both companies expect sales of their products to ramp up with the August introduction of Microsoft Corp.'s Windows 95, though concerns remain that Delrina's fax software and Symantec's utilities could take a hit from the native capabilities available in Windows 95.

Both companies will retain their full product offerings.

The complementary mix of Delrina's communications software and paging technology with Symantec's personal information managers could benefit mobile users in particular, said David Yockelson, program director at Meta Group, Inc. in Stamford, Conn.

Strong presence

Delrina has encountered setbacks recently, with sluggish sales and a loss expected this quarter due to a restructuring in preparation for Windows 95. But Delrina retains a strong presence in the retail channel and its numerous OEM agreements.

"Symantec needs Delrina a lot more than Delrina needs Symantec," said Chris LeToeq, an analyst at SofTracks in Los Altos, Calif. "This is more of the same in terms of Symantec's plan to grow through acquisition."



Symantec CEO *Gordon Eubanks says Delrina's FormFlow will help Symantec's enterprise efforts*

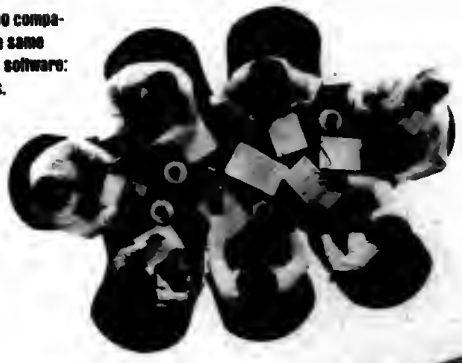
Workflow gains

Symantec also wanted to gain Delrina's electronic forms business (with FormFlow) and strong presence in U.S. government information systems shops, Eubanks said. These will give Symantec a solid position and brand-name recognition in the growing workflow market.

"If nothing else, it gives the product more money muscle" and further validates the electronics forms market, Yockelson said.

Windows 95 versions of Symantec's products, including Norton Utilities, will ship in August. Delrina's WinFax, WinComm and CyberJack software for Windows 95 will ship by December.

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IBM bids to keep SNA users in fold

Cheaper controller clears way for migration to peer-to-peer networks

By Craig Stedman

Trying to keep mainframe SNA shops from abandoning ship, IBM this week will introduce a lower-cost replacement for its aging and expensive 3745 front-end processor.

The move should finally make it feasible to set sail toward IBM's peer-to-peer update of SNA, users and analysts said.

Opinions vary on how many SNA users will buy a ticket for the Advanced Peer-to-Peer Networking (APPN) protocol. APPN replaces the host-centric topology of SNA with a distributed network of equals, tied together with a directory service that dynamically routes data to the proper node.

But IBM's new 3746 Model 950 communications controller at least gives users needing to connect terminals and PCs to mainframes a native APPN routing device that compares favorably with TCP/IP-based routers, observers said.

At the controls

IBM's 3746 Model 950 communications controller will be released in the following two stages:

Supported features	Availability
Initial version:	
• APPN routing	Summer 1995
• Data requester for 3270 terminals	
• Escon channel attachment to mainframe	
• Token Ring LAN attachment	
Second version:	
• TCP/IP routing	Q1 1996
• High Performance Routing version of APPN	
• Frame relay	

"What the [3746] turns into is a giant router," said Dave Snyder, network development manager at the state of Illinois' central management services division in Springfield. Illinois has started to use APPN and may widely implement both the protocol and the 3746 early next year. "Our [network] growth is all heading to the 950," Snyder said.

The stakes are high. More than 50,000 3745s and plug-compatible devices are believed to be in use worldwide as terminal-to-host links in SNA networks, analysts say. But many shops have been choosing TCP/IP and LAN protocols over APPN as they install new client/server applications.

IBM has offered a predecessor 3746 Model 900 as a performance-boosting expansion unit for the 3745 since 1992. But the 950 is a stand-alone version that costs less than the 3745 and does not require its pricey Network Control Program (NCP) software.

Mouth is sealed

IBM, which first disclosed plans for the 950 a year ago, declined to comment on it last week. But analysts briefed on the product said it will typically cost $60,000 to $80,000. By contrast, the 3745 goes for $100,000 or more plus $30,000 to $50,000 annually for an NCP license, they added.

Avoiding NCP license fees "is going to be a nice dollar savings," and the 3746 should also be more flexible due to APPN's design, Snyder said. Illinois has attached five 3746 add-on boxes to 3745s with the idea of eventually moving to the 950 and APPN, but most of its data traffic will run over standard SNA for some time, he said.

Canada Mortgage and Housing Corp. in Ottawa plans to replace its 3745 with a lower-end controller when it starts heading toward APPN in the next year or so, said Ken Smith, manager of systems software. But the 3746 Model 950's expected pricing merits a second look, he added.

Managing NetWare environments

ManageWise gets smarter

By Patrick Dryden

Seeking to boost the manageability of its NetWare network environments, Novell, Inc. this fall will roll out several improvements for its ManageWise package for network and desktop management, a company official said last week.

ManageWise provides a single console for monitoring distributed LANs and PCs by integrating Version 1.5 of the LANDesk virus and desktop management tools from Intel Corp. with NetWare management services. Novell released the combination in January to simplify end-to-end control of complex networks. It claims to have shipped about four times as many copies of ManageWise as its solo management package a year ago.

The upcoming improvements to ManageWise solve NetWare management problems such as integration with enterprise directory services, control of server programs and interoperability with standard management platforms (see story below).

One upgrade sought by users — inclusion of the significantly expanded LANDesk 2.0 — remains in limbo, however. Overhauling ManageWise to integrate that version's software metering and distribution, scripting and task-oriented design "probably will not happen any time soon, Novell officials said.

Intel has fixed incompatibilities so that ManageWise users can upgrade their LANDesk suite, and it promises to extend support from that console to manage Microsoft Corp. Windows NT networks this fall.



But network administrators such as Verne Armstrong, senior information systems engineer at freight broker Fritz Companies, Inc. in San Francisco, said he expects Novell to provide all the latest pieces of ManageWise.

Avoiding squeeze

"It's hard to adopt ManageWise with this uncertainty hanging over us," Armstrong said. "We settled on ManageWise for combined network and desktop management because we want the software metering and distribution features in the new LANDesk.

"We don't want to go through an upgrade process. We need this package from Novell now so we can upgrade servers to NetWare 4.1 under a corporate license."

Novell has attained the first level of integration between its NetWare management services and LANDesk 2.0, but not the tight level required by several key functions, acknowledged Vic Langford, vice president and general manager of Novell's management products division in San Jose, Calif.

Some users said they worry about being caught between Novell and Intel as ManageWise evolves. "We pursued ManageWise because no other product clearly addressed all our management needs," said Kent Higgins, network administrator for the Florida Department of Health and Rehabilitative Services. "I hoped Novell would do it right with Intel to smooth out the bumps in the road for me when I'm stuck in the middle trying to get support from each one."

For one thing, Novell must clarify how ManageWise will compete with the systems management server (SMS) from Microsoft, said Tim Wilson, a management analyst at Decisis, Inc. in Herndon, Va.

"Right now, ManageWise offers decent network management but is weak on the desktop and application side," Wilson said. "The reverse is true for SMS, but Microsoft is working to add network management."

Calling all administrators

Users familiar with NetWare management tools from Novell are eager to see the improvements promised in the next release of ManageWise.

At least three enhancements to the suite of NetWare tools bundled in the ManageWise package are in beta testing now for fall availability, said Vic Langford, Novell's vice president and general manager of the management products division.

First, Novell plans to tightly integrate ManageWise with the NetWare Directory Services (NDS) of NetWare 4.1. Then administrators will not have to run the NDS management program separately to change users and manipulate other aspects of the network, Langford said.

Novell has undercut its former management software prices and now offers ManageWise with NetWare to lower the cost of adoption, but covering a 1,000-user network costs up to $12,000 plus add-on components.

Second, Novell is integrating the ability to manage NetWare Loadable Module (NLM) programs on servers.

"Better NLM management would be a godsend," said Verne Armstrong, senior IS engineer at freight broker Fritz Companies. "This could help us distribute and upgrade NLMs instead of having to [run the separate RCONSOLE utility] to the servers or rely on other scripting tools."

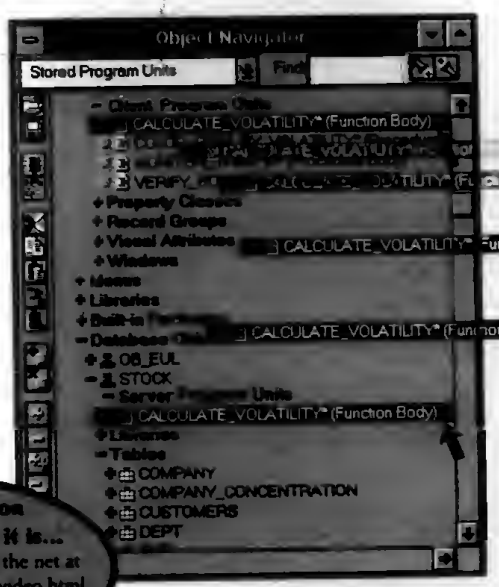
> "Putting more tools in one console will help as we shift to NetWare 4.1. That's a good direction, as long as ManageWise doesn't get hideously more expensive than it is now."
>
> —Kent Higgins, network administrator, Florida Department of Health and Rehabilitative Services

Third, Novell is changing its server management agent software to be fully rather than partially based on Simple Network Management Protocol (SNMP), a standard method for monitoring and configuring devices across a network. Then administrators can see into the "black hole" of NetWare LANs from their consoles and handle alarms properly, Langford said.

Novell has already done this with IBM's NetView for AIX, he said, but SNMP standardization will let ManageWise work with management platforms from Hewlett-Packard Co., SunSoft, Inc., Tivoli Systems, Inc. and others.

"ManageWise needs more interoperability," said Kiran Movva, a LAN analyst at Chevron Information Technology Co. in San Ramon, Calif. "I'd like to see better reporting tools, more flexible identifiers and a single database repository for correlating events, too." —*Patrick Dryden*

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LAN/host file transfer gets easier

By Patrick Dryden

Seeking to smooth data exchange between mainframes and LANs, Microsoft Corp. and Proginet Corp. will this week introduce enhanced file transfer software for shops adopting Microsoft's BackOffice.

Proginet's Fusion File Transfer Management System (FTMS) software, which provides the first MVS-to-NT integration, will ship the same day as Windows 95, officials said.

Fusion FTMS prices will range from $19,000 to $119,000 for the MVS software, depending on the mainframe model, and from $2,995 to $9,600 for the NT Server software. It will cost $695 per user for each Windows 95 or Windows NT client.

The collaborators hope to displace host integration links based on OS/2 and Unix platforms, such as Legent Corp.'s XCOM OS/2-based package, and to spur acceptance of Microsoft's OLE technology as a means for transparent access to mainframe data from network clients.

Fusion FTMS components run on an IBM System 390 mainframe with MVS/ESA and on a Windows NT server, which can be based on one or more Intel Corp. or RISC processors. Together, they coordinate transfers through Microsoft's SNA Server and other BackOffice servers for enabled clients.

With all the pieces in place, a user creating a spreadsheet in Microsoft's Excel, for example, could embed and hot-link to mainframe data without learning special access procedures or loading other software, said Joe Mohen, chief technical officer at Proginet in Uniondale, N.Y. Mainframe reports can be exported into a spreadsheet or sent directly to other end users via Microsoft's Exchange messaging server, he said.

Microsoft said Fusion FTMS coupled with SNA Server will integrate mainframe data with more than 550 OLE applications available now.

Host data access

OLE capability should enable more efficient mainframe data access within organizations that adopt Fusion FTMS, said beta-tester Gregg McGilvray, chief technology officer at Interactive Computerized Elections in Farmingdale, N.Y.

Because his company conducts elections for unions, trade associations, banks and brokers, McGilvray must access many host systems beyond his control. He said he wants tighter control over the transfer process than he had through OS/2-based 3770 software and the remote job entry (RJE) function that is widespread on mainframes.

"I hope Fusion will be accepted by the banks and brokers we work with instead of RJE," he said. Transfers are fast and efficient, and "I like the ability to restart if a line drops and [to] track overnight exchanges through the activity log."

@ Talkback@cw.com

WE ASKED: What has been your experience with Version 3 Release 1 (V3R1) of IBM's OS/400 operating system for the AS/400? There had been some complaints about bugs and technical support problems [CW, June 26].

YOU SAID:

We always wait about six months after the release of new operating system software before installing it. This gives us a chance to make sure IBM has fixed the major programming flaws. Every [OS/400] release so far has had many flaws and many fixes. That is a fact of life many people seem to be missing.

[With] a major overhaul like this last release, I am shocked [large companies] were naive enough to take it on faith — especially in the face of IBM's downsizing of its technical support areas.

■ James Thomas
WOSCA Shippers Cooperative
james.thomas@wosca.e-mail.com

We installed V3R1 in January. The install was clean and easy; we installed first on a development box and two days later on the production system. We are not on the leading edge of technology, and perhaps other shops have had bugs with the higher-level applications [such as TCP/IP]. But for the average shop, V3R1 should not be a problem.

Yes, IBM's technical support could have been better. We called with a simple question on the documentation, and IBM made it painful to reach a technical support representative. Once connected, the answer to the question was quickly handed.

■ L. R. Watkins
MIS manager
J. L. Hammett Co.
hammett@world.std.com

Your article on OS/400 Version 3 Release 1 was not at all representative of our experience. The installation of V3R1 was painless, and we have not experienced a single problem since installation.

■ Kenny S. Irick
Senior systems programmer
Resources Trust Co.
Kirick@aol.com

We installed V3R1 on June 17. I ran the automatic install over the weekend and had very little trouble. Our problems since have been more disturbing. Overall user response time was noticeably slower. Client Access/400 for Windows (IBM's PC connectivity software) refused to work in conjunction with our Novell server. IBM's help desk recommended the newest [bug fix], and it seems to have cleared up the problem.

I like the new version overall, but the slower interactive response times make it hard to convince users that we have something better.

■ Peter Rasmussen
Brigham Young University
peter_rasmussen@byu.edu

News Shorts

StorageTek slapped with infringement suit

Odetics, Inc. in Anaheim, Calif., last week sued tape library market leader **Storage Technology Corp.** and three of its customers for alleged patent infringement. The suit, filed in U.S. District Court in Virginia, claims StorageTek's 7-year-old Nearline family infringes an Odetics patent that covers the passing of tape cartridges between libraries. Odetics seeks to license the patent to both StorageTek and its customers. StorageTek, based in Louisville, Colo., denied any infringement and said the notion that Nearline users should pay license fees to Odetics "is spurious and offensive."

Notable offers stock quotes

Wireless network vendor **Notable Technologies, Inc.** in Bellevue, Wash., will offer a wireless stock market news and alert service. The Septor Financial Information Service will provide stock quotes, news and information from **Telescan, Inc.** and **Reuters Ltd.** via alphanumeric pagers or palmtop computers.

AT&T aids telecommuters

AT&T Corp. last week announced AT&T Alternative WorkPlace Solutions, a set of services for telecommuters. With one offering, called Remote Agent, companies can have inbound 800 calls routed to far-flung telecommuters who would normally work in call centers. Available this fall, the package will let users add electronic message and teleconferencing services to their AT&T Software-Defined Network.

Bells merge cellular units

Bell Atlantic Corp. and **Nynex Corp.** last week announced the merger of their cellular businesses. Bell Atlantic Mobile and Nynex Mobile. The joint venture will be called Bell Atlantic Nynex Mobile and will be based in Bedminster, N.J. It will serve 3 million customers and offer new wireless voice, paging and data communications services and products in the coming weeks, according to a spokesman.



Oracle readies upgrades

After posting record sales growth last month for its financial and manufacturing applications for fiscal 1995, **Oracle Corp.** plans to unveil next week key upgrades to those client/server packages. Release 10G is a long-awaited graphical version of the Redwood Shores, Calif.-based vendor's applications. Release 10.5, meanwhile, is an upgrade to Oracle's character-based programs expected to sport faster response time and several other new features.

HP plays 'net catch-up

Scrambling to make up for lost time, **Hewlett-Packard Co.** will announce an Internet marketing program for its Unix servers this September, the company said last week. Industry analysts said HP's move is in response to spring announcements by Unix rivals **Sun Microsystems, Inc.** and **IBM**. HP said it intends to combine consulting and support services with existing and new Internet products.

AT&T GIS adds notebook

AT&T Global Information Solutions last week announced a new entry to its value line of notebook computers — the Globalyst 130. Weighing in at 5 pounds, including battery, the notebook features an Intel Corp. 75-MHz 486DX4 processor and costs $1,999. For that price, users can get 4M bytes of RAM, a 340M-byte hard drive, a 10.4-in. passive-matrix color monitor and starter kits for four on-line services — America Online, CompuServe, Prodigy and GENIE.

Platinum adds SNMP support

Platinum Technology, Inc. in Oakbrook Terrace, Ill., last week introduced AutoSys 3.2, a new version of its Unix job scheduling software with added support for the Simple Network Management Protocol for linking with network and systems management applications. Platinum also announced AutoSys/Xpert 1.0, an add-on to AutoSys 3.2 that supports three graphical user interfaces to help administrators monitor and troubleshoot complex job flows. Both products will be available July 31.



Pentium secrets revealed

A German computer programmer last week posted confidential information about Intel Corp.'s top-of-the-line Pentium chip on the Internet. The document spelled out specifics on the innards of Penlium, including details on performance levels and speed. To get the same information today, programmers can sign nondisclosure agreements with Intel, which last week had no comment on the incident.

SHORT TAKE Pharmaceutical giant **CIBA Ltd.** has announced it will use **Documentum, Inc.**'s Enterprise Document Management System as its corporate standard.

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Client/server RAID on low-cost track

By Steve Moore

Disk arrays are rapidly becoming affordable for client/server users, as evidenced by Data General Corp.'s introduction last week of an "entry-level" disk array priced at $10,995.

Until recently, client/server users have been frustrated by RAID technologies out of the mainframe world bearing six- or seven-figure price tags.

Some RAID vendors sought to avoid embarrassment by replacing the term "inexpensive" with "independent" in the acronym redundant arrays of inexpensive disks, even though arrayed disks are not typically fully independent of one another.

Today, however, client/server users can choose from a range of RAID products. Some, such as DG's new Model 150, target high-end PC LAN environments. Others, such as the Harmonix system from EMC Corp. in Hopkinton, Mass., target midrange Unix environments.

Users said they see the need for RAID at both ends of the spectrum.

"We have three Novell servers that don't have a lot of storage on them, and if in the future we upgrade them, we will certainly take a look at [the DG Model 150 disk array]," said Alex Henry, MIS director at the William Morris Agency in Beverly Hills, Calif.

Henry described the Model 150's price as "not cheap, but not really expensive." The agency uses the Westboro, Mass., company's higher-end Clariion RAID systems for its Unix environment.



Tough climb

Analysts said RAID technology still faces an uphill battle for acceptance in client/server sites.

Clariion "has been the Cadillac of RAID products, [but] its limitation is that it is complicated," said Mark Friedman, an analyst at Demand Technology, Inc. in Naples, Fla.

"Users still perceive RAID technology as too complex," said Rob Enderle, an analyst at Dataquest, Inc. in San Jose, Calif. "The typical customer wants to buy a box, plug it in and that's it. They don't want to worry about different RAID levels."

RAID levels specify several data protection techniques that can be used, as appropriate, with applications that use storage systems in different ways.

A ray of RAID

Entry-level client/server disk arrays

DATA GENERAL, Clariion Model 150	
Disk capacity	6G bytes
Cache memory	8M bytes
List price	$10,995
EMC, Harmonix	
Disk capacity	8G bytes
Cache memory	448M bytes
List price	$32,800

New AutoRAID products due next week from Hewlett-Packard Co. should further allay users' concerns about RAID, said Farid Neema, president of Peripheral Concepts, Inc., a market research firm in Santa Barbara, Calif.

With AutoRAID, users will not need to worry about RAID levels because HP's software automatically "performs dynamic data migration to place data on the best RAID level configuration, optimizing cost and performance based on data usage," Neema explained.

Another advantage of AutoRAID is that "you get pretty good performance without having to spend a lot of money on cache [memory]," he said.

AutoRAID "is the first RAID we've seen at any level that can be configured on the fly" and allows users to "add capacity one disk at a time without taking the system down," Friedman said.

HP's AutoRAID technology will apply to Unix and PC platforms and reduce administrative labor costs, according to HP product manager Roger Buckthal.

"Retuning some [nonautomated] RAID systems takes a weekend of activity," he said.

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Mac clone market

Apple rethinking licensing efforts as vehicle to boost market share

By Lisa Picarille

Six months after announcing it would license its proprietary Mac OS, Apple Computer, Inc. has signed up only four licensees, leaving industry watchers wondering how serious the vendor is about developing a Macintosh clone market.

Sources inside Apple said the company was scaling back on the number of licensees it would initially take on after determining that widespread licensing may be an unrealistic approach to growing market share. That is especially true because only one of the four current Mac OS licensees — Power Computing Corp. — is building mainstream, general-purpose Macintoshes.

Even IBM — Apple's PowerPC partner — has yet to formally sign on. IBM has said it plans to license Mac OS to run on its Common Hardware Reference Platform (CHRP) systems, due in the second half of next year.

A failure to attract other big-name computer makers is disappointing for Apple but not unexpected — and not fatal for Macintosh users.

"We don't feel like we need 30 companies delivering Mac systems as long as there are at least a handful to fill the needs of Mac users," said an information systems manager at a West Coast aerospace firm that has thousands of Macintoshes.

After a decade of internal struggling over whether or not to license Mac OS, Apple decided in 1994 that allowing other companies to make Macintoshes would increase its overall market share by up to 4%.

Apple officials now admit they underestimated how big a task the licensing effort would be.

"It was more work than we anticipated," said Jim Gable, director of common platform, Mac OS licensing at Apple. "And because of that, we will be turning some people down."

A handful of overseas manufacturers interested in licensing the Mac OS are having trouble striking a deal. Some of the Asian companies, including Tatung, Mitac, Umax and DTK, claim Apple is demanding hefty licensing fees, offering very restrictive contracts or, in some cases, not responding to licensing requests, according to sources close to the Taiwanese companies.

"Licensing fees may be too high for some of these people, but they are no higher than what Microsoft is charging," said Pieter Hartsook, editor of "The Hartsook Letter" in Alameda, Calif.

As for Apple's restrictions, they prohibit Macintosh clone makers from altering the Macintosh read-only memory or the operating system, which means manufacturers can differentiate their clones only by changing the form factor.

But that will change with CHRP.

"Right now, we are in phase one, where we are learning about licensing and supporting the current licensees. Phase two is CHRP, where we can expand the number of licensees because we will only have to worry about the software, not the hardware," Gable said.

For users, this means any CHRP-compliant system they purchase will be able to run Mac OS and five other operating systems. But it would be in Apple's advantage to license its operating systems so users can buy CHRP systems with Mac OS preloaded.

He says, she says

Apple rebuts criticism of its Mac OS licensing

Analysts, potential licensees say:	Apple responds:
Licensing fees are too high	Our fees are in line with the industry
Licenses are too restrictive	We don't want Mac OS on the Intel platform
Licensing staff is too small	We are ramping up licensing staff
Apple is holding back on licensing to Asian manufacturers	We are currently negotiating with many Asian PC makers

The Common Hardware Reference Platform hits some speed humps. See page 41.

New modem spec to bring multimedia to masses

By Bob Wallace

A poor man's version of multimedia conferencing is coming to the masses.

Officials at the International Telecommunications Union (ITU), a global standards-setting body, are finalizing a specification for analog simultaneous voice/data (ASVD) transmission using dial-up lines and modified modems.

The modified modems and links would enable geographically dispersed end users to converse and share a whiteboard. ASVD can also enable remote access, help desk and customer service applications. The modems are due out by year's end.

ASVD is a low-cost option for users who want to support these applications but do not have access to Integrated Services Digital Network (ISDN) in their region or feel that local carriers are charging too much for the service.

The ASVD specification, which could be approved this fall, is based on modem technology codeveloped by AT&T Paradyne, which is AT&T Corp.'s equipment unit, and AT&T Bell Laboratories, which is AT&T's research and development organization.

The specification would enable other modem vendors to modify their 14.4K bit/sec. modems to transmit voice and data (at up to 4.8K bit/sec.) over an analog line. ASVD-compliant modems automatically sense silence in phone conversations and boost the data rate to 14.4K bit/sec.

"Modems have been going in a better-faster-cheaper circle, and with ASVD, the focus is on 'better,'" said Maribel Lopez-Howard, a research analyst at International Data Corp. (IDC) in Framingham, Mass. "This isn't a technology searching for an application."

"I really see remote access as the prime driver here, though the technology could be used for help desk applications as well," said Maralyn Rosenblatt, formerly a network manager at Lockheed Corp. and now a principal consultant at MIR Enterprises, a Canoga Park, Calif., consultancy that specializes in telecommunications and multimedia. "In both scenarios there would be a need to call up files."

The deciding factor

Analysts said Paradyne will determine the fate of ASVD.

In a move to accelerate licensing, Paradyne will levy a one-time licensing fee of about $250,000 per vendor but will not charge vendors royalties for use of the technology, a Paradyne spokesman said.

"If AT&T makes licensing ASVD attractive to others [such as U.S. Robotics, Inc.], it should gain critical mass very soon, in part because it's the only game in town," said Lopez-Howard. "And if they don't, they could be the only vendor in town with the technology."

An ITU spokesman said upgrading a 14.4K bit/sec. modem to support ASVD could cost as little as $30 to $40. ASVD does not require major changes because it does not use voice encoding or multiplexing.

Although analog ASVD does not approach the 144K bit/sec. of bandwidth in an ISDN line, the analog links needed are ubiquitous, whereas ISDN is not.

And with ASVD, users pay as they go, while full-time ISDN links carry monthly fees.

Analog simultaneous voice/data technology (ASVD) vs. Integrated Services Digital Network (ISDN)

ASVD

- Uses existing analog dial-up lines
- Has limited bandwidth
- Dial-up links are ubiquitous
- Can be licensed to other modem vendors
- Uses pay-as-you-go usage lines
- Uses modified modems

ISDN

- Uses digital links
- Provides up to 144K bit/sec. bandwidth
- Has wide variety of equipment available
- Has monthly charges and usage fees
- Doesn't require modems but does require terminal adapters
- Requires tedious provisioning process

Link me up, Scotty

A separate effort is under way on a competing specification for digital links that supports higher speeds but is based on a more complex technology.

According to supporter U.S. Robotics, the alternative spec for digital simultaneous voice/data will not close the door on ASVD.

U.S. Robotics led the modem industry with a 22% share of the 7.1 million 14.4K bit/sec. modems shipped last year, according to IDC.

"We have to hear AT&T's story [on ASVD strategy], but we haven't heard it just yet," said a U.S. Robotics spokesman.

Alternating voice/data transmission comes from Radish Communications, Inc. With this technology, users have to stop talking in order for data to be sent over the dial-up link.

—Bob Wallace

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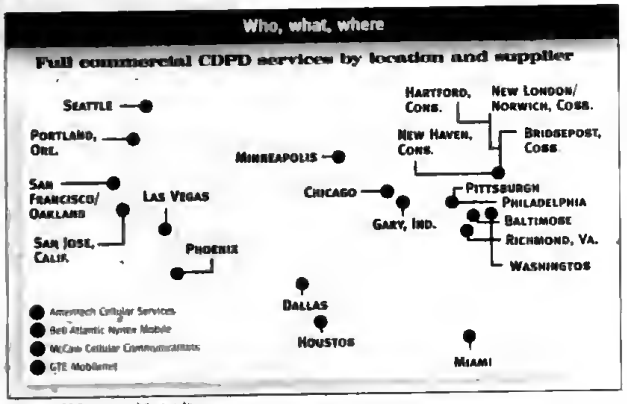
Z-NOTEFLEX, FLEXSHOW, FLEXDOCK and "Make The Connection" are trademarks of Zenith Data Systems Corporation. Intel/OEM. PC Tools is a trademark of Central Point Software, Inc. *Figure based on two-battery configuration. Battery life depends on application. †Additional Type-I, Type-II and Type-III PCMCIA slots are available with optional modules. Specifications are subject to change.

Pokey pace of CDPD triggers doubts

By Mindy Blodgett

After a bust "year of the wireless," analysts and users are beginning to doubt the viability of CDPD technology, which sends data over the existing cellular infrastructure.

Developed by McCaw Cellular Communications, Inc. in Kirkland, Wash., Cellular Digital Packet Data (CDPD) supports short, bursty data transmissions via IP-based wireless packet technology. By now, CDPD was supposed to have been deployed nationwide, but its drive forward sputtered when carriers failed to carry through on promised service.



Source: CDPD Forum, Inc., Arlington, Va.

Observers are not counting CDPD out, but they say this delay, coming as it does on top of so many promises and such a long wait, puts the wireless transmission protocol in danger of being overtaken by other technologies such as personal communications services (PCS).

Iain Gillott, an analyst at Link Resources Corp. in Framingham, Mass., was an early, enthusiastic believer in CDPD's promise. But he is running out of patience.

"There are other solutions coming down the line like PCS," Gillott said. "One of the problems is that people are just not beating down the door, desperate for CDPD."

The reason for many users is price, Gillott said. "And other customers just don't trust it. The carriers have hyped this thing to death. At this point, it doesn't look as if you will have a nationwide network and roaming until mid-1996. And that may be too late," he said.

Mark Langner, an analyst at Telechoice, Inc. in Verona, N.J., said, "CDPD had a lot of promise, but it is not going to take off until there is a nationwide network."

McCaw originally promised CDPD coverage last year, and many predicted nationwide, seamless service by the end of last year. But by April, the company had only provided service in Miami.

Aside from McCaw, a wholly owned subsidiary of AT&T Corp.; Bell Atlantic Mobile, which recently merged with Nynex Mobile to form Bell Atlantic Nynex Mobile; and GTE Corp., the carriers have taken a cautious approach to CDPD. Airtouch Communications' recent decision not to deploy a CDPD network in San Diego raised another red flag.

Amy Damianakes, a spokeswoman for Airtouch in San Francisco, said the company backed off because customer interest was lagging.

"We also had a lot on our plate right now with building cellular markets in Europe," Damianakes said. "We will take a closer look at CDPD later."

Not surprisingly, users have taken a wait-and-see attitude as well. "We are evaluating CDPD, and we are giving it a close look," said Stanley Cooper, a network engineer at Visa International, Inc. in Redwood City, Calif. "But we aren't convinced."

Computing giants jump into the wireless market. See page 57.

Protocol said to be finally revving up

While some voice concerns about the future of the sluggish CDPD protocol, backers of wireless data transmission technology say the pieces are now falling into place.

CDPD supporters can point to several advances, including announcements of network deployments in recent weeks from McCaw and GTE.



As CDPD developers travel to Philadelphia this week for the annual CDPD Forum's membership meeting, backers of the technology insist it is now beginning to live up to the hype.

"The carriers have been burned in the past by overpromising, so that isn't happening anymore," said Rand Baldwin, the CDPD Forum's executive director. "It's not just hype anymore, it's really happening. It is starting to live up to its promise in a big way," he said, referring to network rollouts.

Two weeks ago, GTE Mobilenet deployed a network in Richmond, Va. In addition, the Atlanta-based company plans to launch networks in nine cities in the next 90 days.

And last week, McCaw announced commercial availability in Seattle, Minneapolis, Las Vegas and Portland, Ore., with four more cities to follow in the next few weeks. —*Mindy Blodgett*

Imaging vendors put users in control

Development environments image-enable current apps

By Tim Ouellette

When it comes to imaging, some users just don't want to manage another large proprietary application on top of their normal business systems.

With this in mind, imaging vendors have focused on providing users with ways to image-enable their existing applications via development environments such as Microsoft Corp.'s Visual Basic or Powersoft Corp.'s PowerBuilder (see chart).

For example, Wang Laboratories, Inc. just released additional image controls for its Open/image Custom Controls for Visual Basic by adding image annotation, image scale-to-gray and administration. The Wang controls, or ready-made software components, will be part of the image viewer found in a future version of Windows 95 [CW, April 17].

"The best one I like is the annotation," said Kiran Thakrar, president of SoluSoft, Inc., a systems integrator in Wilmington, Mass. He uses the controls to let users redline, add electronic sticky notes to images and black out the check amount in a financial application.

Some users resist imaging as a separate proprietary application because they do not want to manage a different imaging application on top of their business applications, Thakrar added.

With the Wang controls, users can use Visual Basic applications as a front end to Wang's back-end Open/image servers. "Users like the custom front-end screen and the way Wang handles all the imaging," said Jack Black, staff manager at Analysts International Corp. in Houston.

David Yockelson, an analyst at Meta Group, Inc. in Stamford, Conn., said the new controls help bring Wang's Visual Basic efforts in line with its work in the PowerBuilder arena, especially by providing the annotation controls.

Typical imaging controls let users scan images, perform optical character recognition on the file, manipulate, rotate and zoom; annotate on the image; and fax or print the image file.

Like Wang, FileNet Corp., a leader in the traditional imaging systems market, offers FileNet WorkFlo Controls for Visual Basic. "It is used by a majority of our customers that write line-of-business applications" alongside FileNet's imaging system, said Jordan Libit, vice president of marketing at the Costa Mesa, Calif., firm.

At the American Institute of Foreign Study, Jeanne Pollock turned to a system using Diamond Head Software, Inc.'s controls so the institute could continue using an 8-year-old Oracle Corp. legacy application rather than installing a new system.

"We didn't want to give up all the querying capabilities" of our legacy system, said Pollock, director of information services at the Greenwich, Conn., institute. The imaging system lets users compare database fields with essays in image files.

Though custom controls are relatively inexpensive ($195 for the Wang product), analysts said a longer development cycle, support costs and upgrading one's own system must be considered. But time is of the essence to many.

"Wang's controls allow us to do quick integration and development," which saves money, Thakrar said. "And at the end of the day, the customer saves money."

A sharper image

Though Visual Basic 4.0 (due later this year) will require the use of OLE controls, the following imaging vendors are providing users with popular Visual Basic controls to image-enable their business applications

Vendor	Product
Diamond Head	ImageBasic 2.0
FileNet	Visual WorkFlo Custom Controls for Visual Basic
Kofax Image Products	KIPP ImageControls
Wang	Open/image Custom Controls for Visual Basic

Carriers agree on standard Internet links

Sprint, ANS and MCI deal could herald better service agreements for users

By Ellis Booker

The three companies believed to carry between 50% and 80% of the Internet's commercial domestic traffic last week announced plans to connect their respective networks.

More important, ANS Co+Re Systems, Inc., MCI Communications Corp. and Sprint Corp. agreed to set "service performance" objectives for traffic on their networks and create standard procedures for resolving service problems.

The announcement could herald the day when business customers will be able to contract "service-level agreements" with Internet network providers.

In the short term, these agreements should ease the concerns of commercial users hooking themselves to the Internet in droves. "As more and more people and businesses rely on the Internet, they expect the same vitality and reliability as the public telephone networks," said Lance Boxer, senior vice president and general manager of the Data Service Division at MCI Business Markets.

The agreements among ANS, MCI and Sprint include the following:

- Service performance objectives such as packet delays across networks
- Procedures for resolving service problems
- Standards for sharing operational data

Yet analysts said there will be technical challenges to overcome first.

The "connectionless" architecture of the Internet makes it difficult for a network provider to guarantee service levels, said Tom Nolle, president of CIMI Corp. in Voorhees, N.J.

Nolle said frame relay, a fast-packet network protocol, is rarely sold on a quality-of-service basis today, though the protocol could support such pricing. "The typical position of carriers has been not to guarantee anything," he said.

Most carriers sell frame relay in terms of simple "availability," and only customers "who are very savvy and have a lot of clout" can persuade a carrier to give them more, Nolle added. This could change as Asynchronous Transfer Mode networks are widely deployed and Internet traffic is mapped to them.

"The Internet has historically had inconsistent levels of quality," said Jordan Becker, vice president of network services at ANS, a subsidiary of America Online, Inc. in Elmsford, N.Y.

Becker said the agreements with MCI and Sprint will include quality-of-service objectives, procedures for resolving network problems and standards for exchanging operational data.

But the agreements among the three providers will not trickle down to contractual service-level agreements for customers just yet, Becker noted.

ANS does offer some customers performance commitments for traffic on its own backbone network, but it cannot yet make the same offer for traffic flowing out to other networks. For instance, ANS offers guarantees for items such as mean time for repairs and network availability but only offers performance "objectives" for items such as end-to-end delay of packet transmission.

There is no umbrella organization for setting performance standards among Internet providers, although the North American Network Operators Group has faced the issue of interoperability among Internet service providers from a technical standpoint. The partners confirmed that other bilateral agreements with large Internet network providers were being discussed. Sources at ANS said agreements with another eight to 10 Internet backbone network companies are likely to be announced in the next two to three months.

Tools emerge to track World Wide Web use. See page 58.

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Novell bargains

CONTINUED FROM PAGE 1

hasten his firm's migration to NetWare 4.1. The upgrade decision will be determined by need — such as maxing out the resources of the current network operating system — rather than by "freebies," he said.

"Stores are always running sales, and networking vendors always offer special promotions," Schuffert said. "We have 35,000 NetWare 3.11 and 3.12 users, and I call that a big incentive for Novell to give us a break when we upgrade to NetWare 4.1 — probably sometime in 1996."

To further ease migration headaches, Novell will increase its online conferences on CompuServe's NetWire and include additional tools on Novell's World Wide Web home page to assist in the move to NetWare 4.1. These last two perks come at a time when some users have been venting their annoyance at recent glitches in Novell's newly released Client Requester for Windows NT Workstations on these on-line services (see stories below and on page 47).

Novell has good reason to herd its flock of NetWare 2.x and 3.x users into the NetWare 4.1 fold quickly, said Dave Capuccio, vice president and research director of network technologies at Gartner Group, Inc., a consultancy in Stamford, Conn.

"Windows NT Server — that says it all," Capuccio said, referring to the looming threat of the Microsoft Corp. operating system. "The competition is fierce. I estimate that 90% of all NetWare sites are installing NT Server as an applications server alongside NetWare, and some of the installed NetWare base of customers are re-evaluating their [network operation system] decisions.

"Novell has to keep sweetening the pot by lowering costs and providing extras like training to ensure that users migrate to NetWare 4.1 and not Windows NT Server," he added.

Novell's latest sales statistics indicate NetWare 4.1 migration is increasing. "From March to June, sales of new NetWare 4.1 servers increased 11%, while straight upgrades rose 24%," Timpson said. "We've seen a definite uptick in momentum, and these incentives should help sustain and increase that momentum."

Novell will also aid customers by offering a special "NetWare 4.1 First Class" hands-on technical training seminar at about 500 Novell Authorized Education Centers worldwide, Timpson said. The class is aimed at network administrators already familiar with NetWare.

Sample pricing for Novell NetWare upgrades from 2.x or 3.x to 4.1:

Number of users	Price*
5	$396
10	$796
25	$1,196
50	$1,596
100	$2,236
250	$3,996

*Promotional prices offered through Oct. 31

@ Talkback@cw.com

Will Novell's recent spate of price-cutting influence your decision to move to NetWare 4.1? Or do you plan to migrate to a Novell alternative? Sound off to us at talkback@cw.com. Please include your full name. We'll publish a sampling of reader opinions in an upcoming issue.

Patching up the Client Requester

Users dismayed by the inability of Novell's Client Requester for Windows NT Workstation to support NetWare 3.11 servers can take heart. Novell pledges to release a patch to correct the flaw in the next 10 days.

Novell released the Client Requester on CompuServe's NetWire forum and the Internet on June 29. Users quickly encountered errors when they tried to connect their Microsoft Windows NT Workstations, equipped with the Network Driver Interface Standard (NDIS) adapters, to NetWare 3.11 servers.

"We've got one bug out there — the NDIS drivers don't support the NetWare 3.11 environment," said Dawn Drake, senior product manager for NetWare clients in Novell's operating systems division. "It never showed up in any of our beta tests. But the fix will be out soon on NetWire and the Web."

Drake said complaints about the Client Requester have been confined to "a couple of dozen people on the NetWire forums and a few users who called Novell tech support."

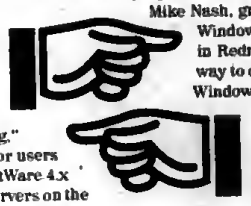
— Laura DiDio

Windows NT, NetWare problems resurface

Drive mapping a trouble spot for users of both products

By Suruchi Mohan and Laura DiDio

Some users are becoming ever more frustrated as they try to take their enterprisewide networks beyond the competitive barrier where Microsoft Corp. and Novell, Inc. continue to cross swords.



The problems are not new, but they are persistent. They resurface with each new release of a product. The latest instance is "drive mapping," which is again a trouble spot for users trying to work with Novell's NetWare 4.x and Microsoft's Windows NT servers on the same network.

Drive mapping is a mechanism by which administrators manage user access to different storage devices and directories.

Conflict arises

To connect to a NetWare 4.1 server, a workstation requires Virtual Loadable Module (VLM) software. Yet the configuration this requires does not let the workstation connect to an NT Server as well, said Mike Murdock, a member of the general data systems team at the University of North Texas in Denton, which runs 87 NetWare servers.

"It's an issue for me and my users because we have a mail system that needs VLMs and a client/server solution that runs best on NT Server," he said. This means that users grabbing data from an NT client/server database would have to reboot the client workstation to connect to the mail system.

Scott Phelps, a LAN administrator at the Internal Revenue Service in Austin, Texas, has another drive mapping problem. His NT workstation users have to map drives to NetWare every time they log in because NetWare does not maintain drive mappings as it should for NT.

Mike Nash, group product manager for the Windows NT Server group at Microsoft in Redmond, Wash., claimed the best way to connect clients to NetWare and Windows NT servers simultaneously is to use Microsoft's File and Print Services for NetWare. This "is designed especially to let NetWare clients attach to Windows NT servers without requiring any changes to the client desktop," he said.

File and Print Services for NetWare is a utility that makes a Windows NT Server look and feel like a NetWare file and print server.

Dawn Drake, a senior product manager for NetWare clients at Novell, blamed Microsoft for the drive mapping problems. She said the troubles some users encounter when they attempt to support multiple network servers are linked to a limitation of the current Windows for Workgroups 3.x architecture. It does not occur in the new Windows NT Workstation 3.51 or the forthcoming Windows 95 environments, however.

But users were not satisfied with these explanations. They said they want the companies to work together — not point fingers. "Microsoft and Novell are going at each other, and users are suffering," Murdock said.

NT on the move

"Novell's tactic could boomerang," said Mike Murdock, a member of the general data systems team at the University of North Texas. "In enterprise computing, users are interested in maintaining the existing technology. Right now we have 87 NetWare servers and three NT servers, but NT could mushroom. NT has aggressive pricing."

Novell unveils a remote access package for PCs. See page 49.

AT&T leads frame-relay race

Study: Company has 34% of market among U.S. carriers

By Neal Weinberg

Despite a late start, AT&T Corp. has managed to parlay its long-distance dominance into a surging lead in the hotly contested frame-relay race, a new study shows.

AT&T broke away from the pack last year, capturing 34% of the $170 million market for frame-relay services among long-distance carriers in the U.S., according to a report released last week by Vertical Systems Group in Dedham, Mass.

AT&T gained 10% market share in one year, while MCI Communications Corp. gained 4%, Sprint Corp. gained nearly 3% and WilTel — first to market in 1991 — lost 10%.

Companies are using frame relay, a fast-packet switching technology, to link multiple LANs at different locations. It provides high bandwidth and is less expensive than building a leased-line network.

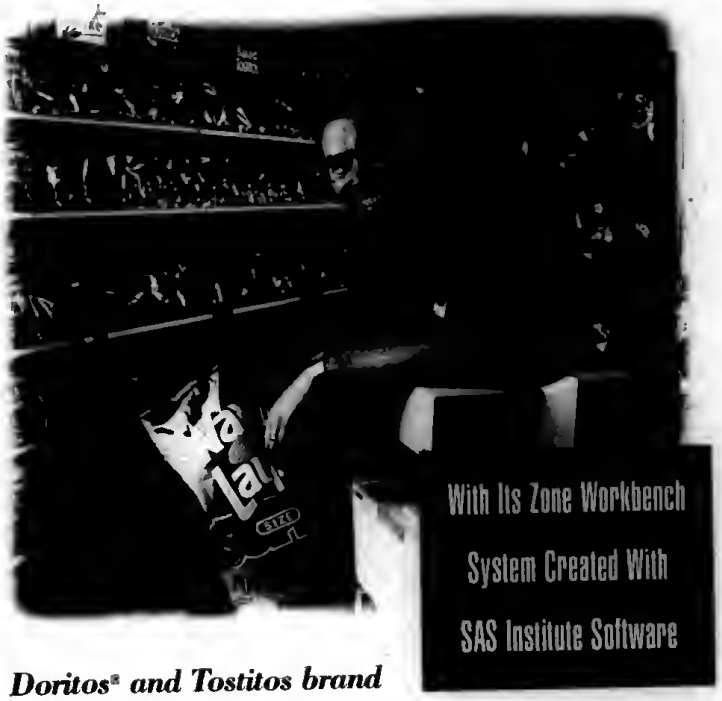
"WilTel got things rocking in the beginning of the market" in 1991, said Kathryn Korostoff, president of Sage Research, Inc. in Natick, Mass. "AT&T was a laggard."

How the war was won

But AT&T leapfrogged the competition through a combination of solid marketing, reliable equipment and "having their foot [already] in the door," said John Coons, an analyst at Dataquest, Inc. in San Jose, Calif.

Erin Dunne, an analyst at Vertical Systems Group, agreed that AT&T has done an effective job leveraging its installed base and name recognition. "The network administrator says, 'AT&T does our voice lines, why don't we have them do our data?' "

How Frito-Lay Handles the Decision Making CRUNCH



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It's hard to imagine any company that understands consumer tastes better than Frito-Lay, a leader in the U.S. salty snack category with annual revenues of more than $5 billion. Yet Frito-Lay is determined to get even closer to its 400,000 retail customers.

In fact, a decentralization effort begun in 1990 has, in the last five years, brought a renewed sense of ownership and empowerment to the 30,000 Frito-Lay employees. As part of this ownership, Frito-Lay's Information/Technology Systems department (I/TS) has created a tactical, market-driven decision support system—the Zone Workbench System—designed to get timely information in the hands of front-line managers.

It's an application built from the customer up, and the SAS® System of software has been there every step of the way.

"The Zone Manager is the first line of communication with our Route Sales force," says Tom Nealon, Director of I/TS for Frito-Lay, whose department spearheaded development of the decision support system. "We knew from the start that the Zone Workbench had to provide information that was 'actionable'. It also had to be portable across client/server, workstation, or laptop environments. Equally important was the ability to integrate multiple data sources."

Delivering More than Software Alone

"Given the tight schedule, the software company we chose had to provide superior applications development tools—as well as comprehensive training, consulting services, and documentation," adds Nealon. "SAS Institute came through on every count, proving time and again the value of having a software vendor that's as interested as we are in completing projects on time and on target."

Nealon calls the Zone Workbench "a tremendously versatile business tool proving user-friendliness, power, and portability between platforms can all operate in one package. The old-style EIS systems are antiques. The game today is to provide information that can impact the marketplace each day, for each of our customers. For Frito-Lay, SAS Institute is making sure we have the tools to make an impact."

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Cigna creates top technology post

Insurance firm dedicates separate IS group to research and development

By Julia King

In a move it says signals the company's ever-growing reliance on leading-edge information technologies, $14 billion Cigna Corp. recently named Stephen Andriole to the newly created post of chief technology officer.

The Philadelphia-based insurance giant also created a 40-person information systems research and development organization, which Andriole will oversee. He is a former academic professor of IS and director at the U.S. government's Advanced Research Projects Agency.

"What we will do in R&D is try and look at technologies that are ripe for development," Andriole said of the new IS function. "We're not going to go into extremely theoretical research, but focus on those technologies that have matured to a point where they can be applied."

The R&D group, whose current budget is limited to covering staffers' salaries, will function separately from Cigna Systems, the insurer's IS arm, which last year had a budget of approximately $275 million and a staff of 1,300 to 1,500 people. Andriole, however, will report to Cigna Corp. Chief Information Officer J. Raymond Caron.

Topping the current list of research topics is intelligent agent software, which Andriole said has the potential to significantly streamline both customer service and claims processing.



Cigna's Stephen Andriole *says R&D is a search for 'ripe technologies'*

In the customer service area, for example, intelligent software agents could be deployed to detect recurring patterns in the millions of calls Cigna receives each year. Knowing these patterns, agents could then automatically retrieve the information representatives need to answer callers' inquiries.

Educating senior executives about technology is also part of Andriole's job. His plan is to deal with many executives' don't-waste-my-time attitude toward IS by developing 30-minute demonstrations that focus on key technology areas.

"You're not going to get people at high levels going off-site for three days to talk about groupware," Andriole said. "So what we'll be giving them is 30-minute snippets, which show people which technologies they should care about and which ones they can pass on."

If past experiences at other large companies are any indication, Andriole's effectiveness at Cigna could go either way, according to George Colony, president of Forrester Research, Inc. in Cambridge, Mass.

Colony pointed out that Colin Crook, who joined Citibank as its chief technology officer, went on to become chief information officer, the banking giant's top IS post.

On the other hand, "there have been advanced technology groups that have run off in crazy directions, so they're viewed as the wackos. [In those cases,] the technology officer becomes a kind of internal gadfly who flaps his arms a lot but doesn't get anything done," Colony said.

Straying from the norm

Advanced technology groups have existed at large companies in other industries for several years. But in the slow-changing insurance business, Cigna's creation of a separate R&D group for information systems, headed by a dedicated chief technology officer, is unusual.

You wouldn't know it from the slick ads in trade magazines, but it's no secret to corporate developers that most traditional application development tools are difficult to learn, hard to use and ill-suited for many tasks. That's true whether you're developing, deploying or maintaining business applications.

Before development even begins, mastering a tool's design methodology and programming language can present a steep learning curve for application programmers familiar with third generation languages such as COBOL, but unfamiliar with the new breed of visual client/server development tools. This training is both expensive and time-consuming.

Once developers master the various GUIs, databases, languages and protocols needed to create a new application, they must integrate and deploy these components across their client/server infrastructures. MIS departments also must ensure that the application runs on all operating system platforms in the enterprise, that it can be easily moved across platforms, and that all users have the most up-to-date version. Deployment can often be as challenging as development.

Modifying or enhancing a business application requires additional code that must be integrated with the existing application. These incremental enhancements must be maintained for the life of the application. This is a complex process that typically results in maintenance costs exceeding initial development costs.

What organizations need is a client/server application development environment that will:

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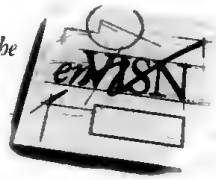


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Gateway software eases net mix

By Patrick Dryden

Revamped gateway software shipping this week promises to ease the integration of legacy and open systems on enterprise networks.

New gateway and client versions to the Brixton Open Systems-to-SNA product line from Computer Network Technology Corp. (CNT) help link mainframes to TCP/IP networks.

The server software adds a distributed gateway that can balance session loads and improve reliability. It sports a graphical user interface to simplify session monitoring and reconfiguration and offloads functions such as file transfers.

On the client side, CNT eases mainframe access with a full-blown Windows version of the 3270 emulator, also gained in last year's acquisition of Brixton Systems, Inc.

Analysts cite a distributed gateway capability as the most important enhancement to Release 3.0 of BrxPU2.1 SNA Server software for two reasons.

"Now administrators can route users among gateways for load balancing," said Glen Gabriel Ben-Yosef, president of Clear Thinking Research, Inc., a Boston-based industry analysis firm.

"This helps even those with a small number of sessions because they can easily spread the load from subnetworks or distinct workgroups," Ben-Yosef said.

Also, the ability to distribute sessions allows fault-tolerant configuration. Administrators can define a second gateway as an on-line backup instead of bringing up a standby SNA server after a failure to re-establish session connections, said Cindy Borovick, manager of network architectures at International Data Corp. in Framingham, Mass.

"Being able to switch over automatically to a reserved gateway is very important when rolling out enterprisewide connectivity," Borovick said.

Distributed gateways can be administered graphically from a single console. This new interface pleased beta-test user Robert Stidham, director of development at Nebrask@ Online, an agency that provides Nebraska state records to banks, insurance agencies and other subscribers.



"This version really removes the tedious nature of 3270 administration," Stidham said. "We can leave an X window open to the gateway to quickly monitor all aspects of a session."

Taking the easy route

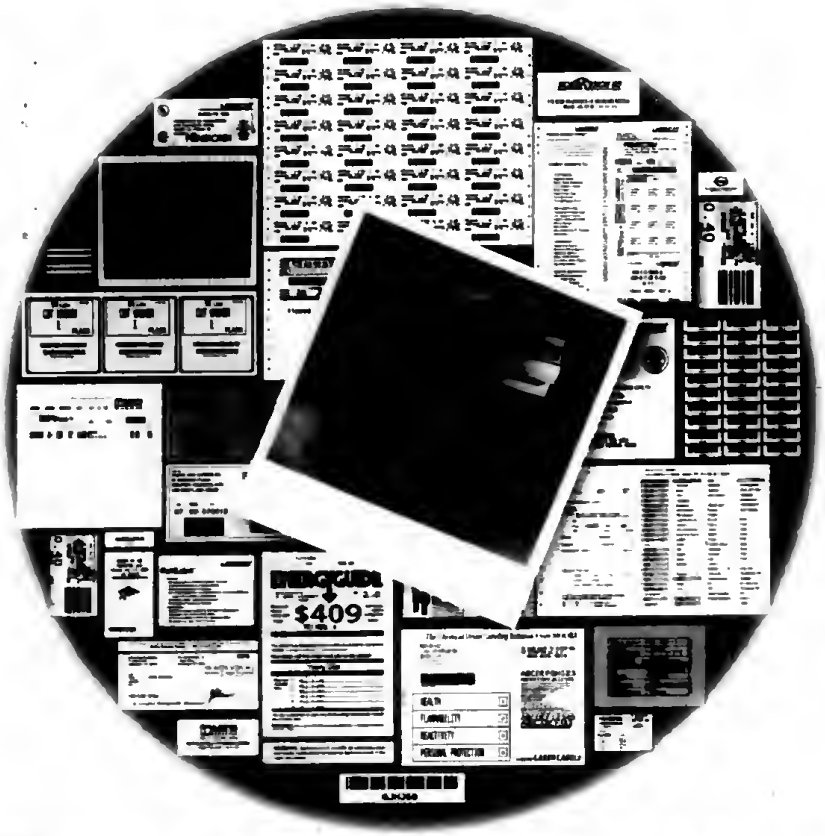
Simply pointing and clicking lets administrators configure sessions in seconds, said Herb Rush, engineering vice president at CNT in Maple Grove, Minn. "Even with thousands of users, the help desk can filter quickly through the configuration data to find [logical units] and [Internet Protocol] addresses."

CNT claims to be first to map functions such as the file transfer protocol from TCP/IP networks on the SNA Server to the corresponding host services via IBM's Advanced Peer-to-Peer Networking.

Without running TCP/IP on the mainframe or adding access software to stations, network users can exchange files and print with the host, Rush said. "This puts your mainframe on an internetwork but with centralized security, accountability and chargeback," he said.

SNA Server software starts at $2,500 for 16 sessions. It runs on Sun Microsystems, Inc. SPARC and IBM RS/6000 servers and will be available in August on eight other platforms, including Microsoft Corp.'s Windows NT.

Corresponding client software for Windows 3.1 is now available, starting at $99. A $49 version disables support for enhanced 3270 emulation, Microsoft SNA Server and Novell, Inc. IPX/SPX.



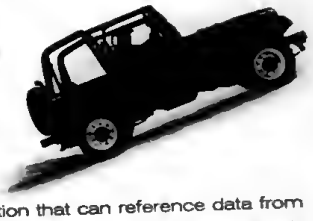
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Data mining

CONTINUED FROM PAGE 1

800G-byte data warehouse.

In the past, agents "would pitch the product-of-the-week to customers with an idea if the customers already had that product or not," Menicucci said. "Now it's a whole new ball game."

Data warehousing — or data mining — is a meatier form of yesterday's decision-support systems. The idea is to gather information, usually sales or customer service data, from various parts of an organization so managers can pounce on business trends that might otherwise go unnoticed.

"You can get an edge on competition that's very real," said Richard Winter, an analyst at The Winter Corp., a consulting firm in Cambridge, Mass. Telecommunications, finance and retail firms in particular have adopted warehousing, he noted.

One of a kind

But the sheer size, breadth and continuous innovation of Bank of America's data warehouse make it stand out not only in the banking sector, but also across industries, analysts said.

The system "is the closest there is to a full enterprise data warehouse," said Bill Bradway, an analyst at The Tower Group, a Wellesley, Mass., banking and technology consultancy.

While warehouses at other banks such as The Chase Manhattan Bank NA in New York typically tap just a handful of departments, the system at Bank of America here draws data from the entire bank and its 30 business units, he said.

This year, 1,200 users are expected to pummel the data warehouse with up to 2,500 complicated queries daily, according to Charles Griffith, vice president of retail MIS at Bank of America's Concord, Calif., office.

Those numbers will continue to grow because the monster warehouse seems to spawn concepts for related applications, said Griffith, who has nurtured the system since its 1986 inception.

"We're coming up with ideas that wouldn't be possible if the warehouse was anything less than company-wide," he said.

On target

For example, the bank recently started to mine for Hispanic customers who are potential first-time home buyers. Once pegged via a dozen or so search variables, this group receives specially targeted solicitations for mortgage loans from the bank.



Bank of America's Charles Griffith *says the enterprisewide nature of the data warehouse spawns a host of money-making ideas*

Many banks have begun plugging credit-card data into warehouses, "but a relative few have progressed beyond that," said Jerry Grochow, director of American Management Systems, Inc.'s Center for Advanced Technologies in Fairfax, Va.

Bank of America officials declined to say how much business they have generated, "but we're going to continue with programs like these, that's for sure," Griffith said.

Despite the warehouse's huge dimensions, response time for an average query is a snappy 30 seconds, he said.

The speed is partly due to a recent change in hardware. In late January, Bank of America swapped a system from Teradata Corp., an AT&T Corp. unit, for an AT&T Global Information Solutions 3600 computer with 102 processors. The bank kept its Teradata database.

The machine is at least 30% faster than its predecessor, with better price/performance, Griffith said.

But warehousing was not always so grand at the company, Griffith said. Previous systems let only select end-user managers ask the information systems staff for custom reports.

IS would then cull information from VSAM mainframes and later Teradata products. Users would have to wait two to three months for IS to wrench data from more than 100 magnetic tapes and then distribute requests, Griffith said.

"Believe it or not, it was useful at the time," he laughed.

Database vendors adopt different data warehousing strategies. See page 75.

Breaking the taboo

Bank of America may soon break a long-held computing taboo about putting on-line transaction processing and data warehousing applications on the same server.

Because the two functions are so dissimilar — requiring fundamentally different hardware and software setups — squeezing them onto the same system often means that neither will perform well.

But Bank of America thinks it can be done.

The company is testing the boundaries of its AT&T GIS' 3600 hardware, on which its 800G-byte warehouse resides. The 3600 is a massively parallel processing (MPP) machine with a twist: It now includes a new knot of processors cordoned off to function as symmetrical multiprocessors (SMP).

It is on that section of the box, which AT&T calls the Application Server, that Bank of America is experimenting with on-line transactions. Data warehousing, meanwhile, runs as usual on the MPP side.

The bank hopes to sweep some information from the warehouse into this SMP area and let users do mobile sales or loan processing against it, explained Charles Griffith, vice president of retail MIS.

"My difficulty until now was that I had to turn away people who wanted to do a one- or two-record search because they might get stuck behind a 60 million-row query," Griffith said.

Experiments with Informix Software, Inc.'s OnLine database on the Application Server have been encouraging so far, he said. He declined to specify test results but said he seeks performance of 300 to 400 transactions per second.

Griffith said he expects to know whether Bank of America will venture further into this no-man's-land by the end of this month. —*Kim S. Nash*

3Com eyes ATM, ISDN markets

Acquisitions fuel diversification

By Laura DiDio and Bob Wallace

Five years after battling back from the brink of extinction, 3Com Corp. is broadening its product portfolio to embrace a series of emerging high-growth technologies.

Now boasting a compound annual growth rate of 1,450% over the past three years, 3Com has left far behind a disastrous foray into the network operating system arena. Its eye-popping growth rate has been fueled by the company's diversification into the switching arena and a series of about 15 acquisitions.

Eric Benhamou, president and chief executive officer of 3Com, said an aggressive assault is already under way, with several new arenas in its sights. The target markets include Asynchronous Transfer Mode (ATM), Integrated Services Digital Network (ISDN) and the emerging small home-office and telecommunications markets.

To accomplish this, the Santa Clara, Calif., company has made four key acquisitions in recent months: ATM maker NiceCom Corp.; ISDN manufacturer Sonix Communications, Inc.; carrier services provider Primary Access Corp.; and Accessworks, Inc., a maker of remote access products for the small home-office market.

With its latest financials, "3Com proved once again that it's built a machine capable of sustaining profitable growth," said Todd Dagres, an analyst at Montgomery Securities, Inc. in San Francisco.

Benhamou said now is the right time for 3Com to "purchase a base in the telco area because deregulation is moving so fast, and the carriers own a large part of the infrastructure."

The addition of ISDN, telecommunications and remote access products to its lineup leaves 3Com with "no major technology gaps or vacuums to fill," Benhamou said. "That doesn't mean we're going to stop acquiring companies — we'll just keep buying when we see a need to fill a specific niche."

In Benhamou's vision of networking in the year 2000 and beyond, 3Com will embrace the Point-of-Presence (POP) business, "which requires both a front-end access device and a router. Together they make a "POP-in-a-box" to help businesses build on-line networks, and that's where 3Com is headed," the CEO said.

Longtime users such as Anna MacKinnon, director of technology at Anderson & Lembke, a San Francisco advertising agency, approve. "We're excited about the move into remote access, and acquiring known entities also helps them get products to market more quickly," MacKinnon said.

MacKinnon said her firm has also been impressed with 3Com's ability to provide users with one-stop shopping.

Christine Heckart, director of broadband consulting at TeleChoice, Inc. in Verona, N.J., also gave a thumbs-up to 3Com's comprehensive strategy.

"Carriers want to go beyond providing wide-area transport, which is a commodity business," Heckart said.

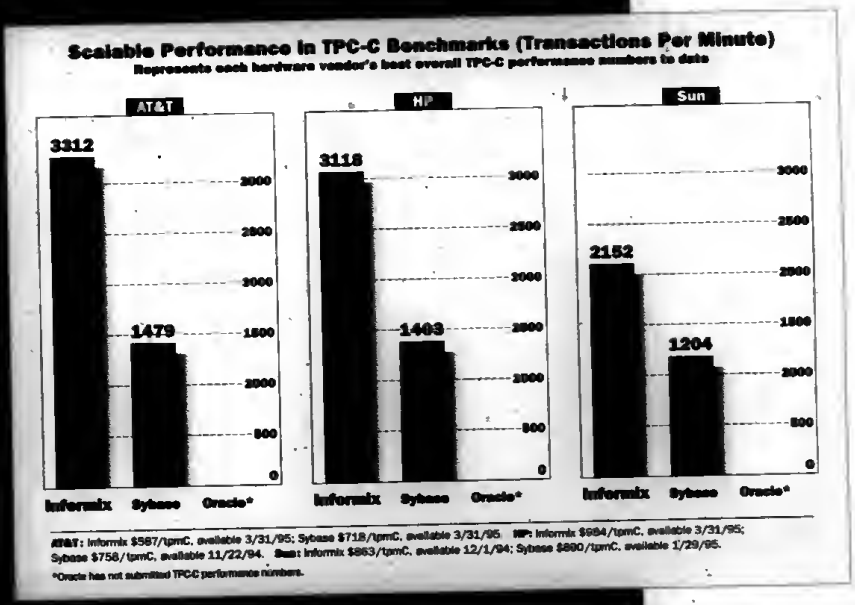
Record highs

3Com posted record revenue and earnings for its 1995 fiscal year ended May 31. Sales for the year rose to $1.3 billion, a 57% gain over 1994 revenue of $827 million. Net income similarly soared to nearly $126 million for fiscal 1995, compared with a loss of almost $27 million last year.

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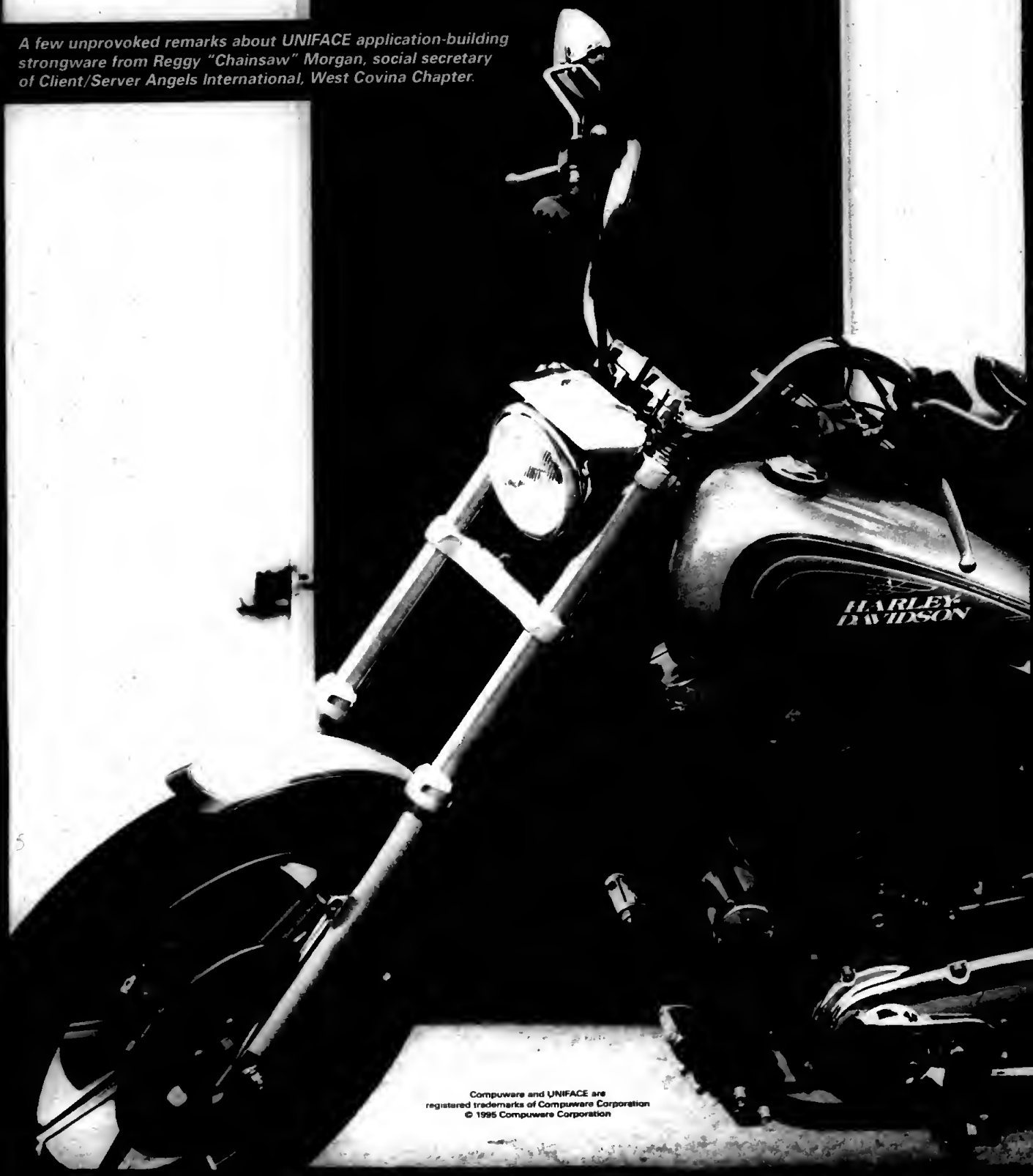
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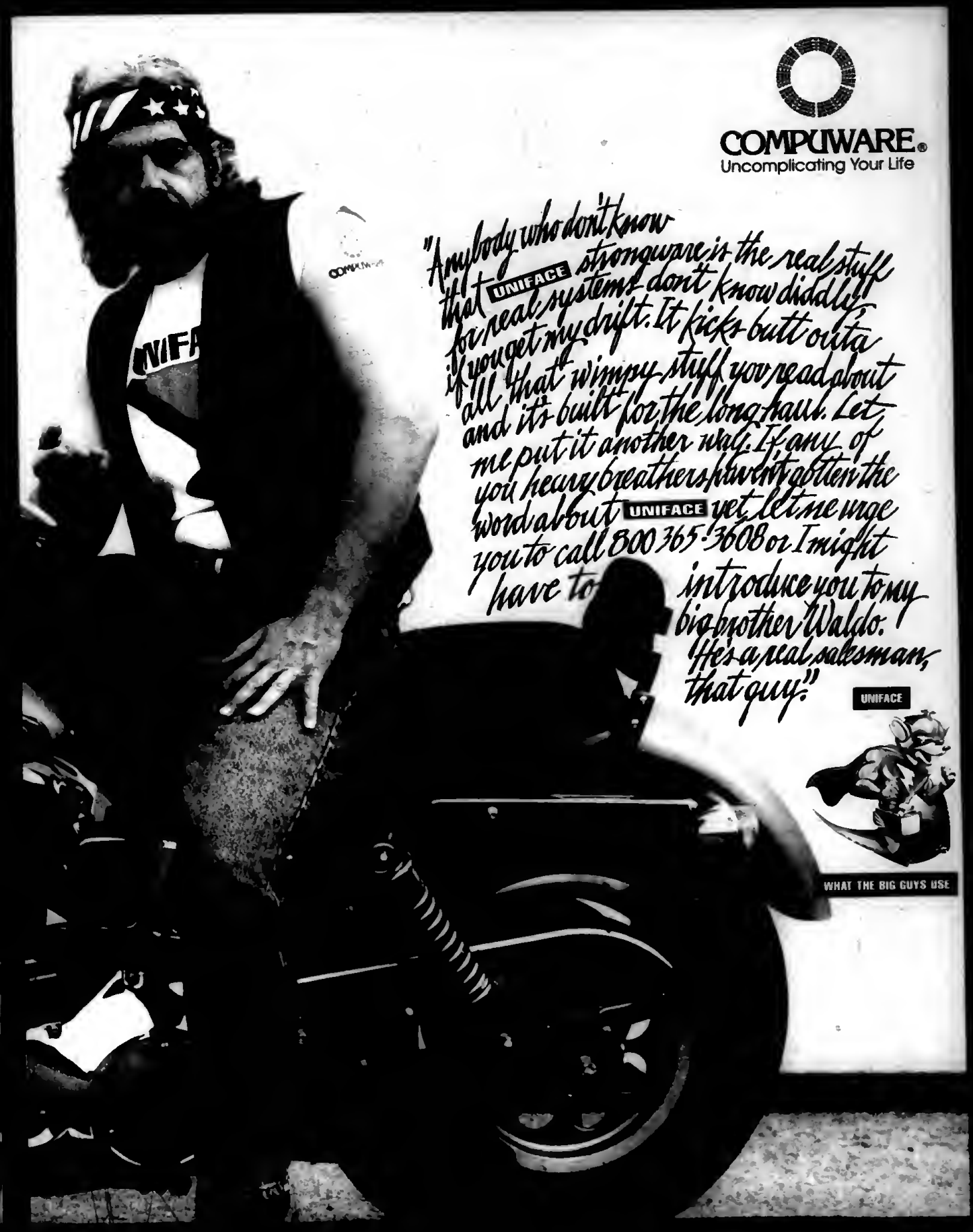
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A few unprovoked remarks about UNIFACE application-building strongware from Reggy "Chainsaw" Morgan, social secretary of Client/Server Angels International, West Covina Chapter.



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WHAT THE BIG GUYS USE

Computer Industry

Briefs

Lotus deal completed
IBM completed its $3.52 billion purchase of Lotus Development Corp. last week for $64 per share. Any Lotus shares not purchased in the tender offer will be acquired by an IBM subsidiary.

Cognos boosts profits
Cognos, Inc. reported revenue of $46.4 million for its first quarter ended May 31, up from $38.2 million for the same period in 1994. Profits rose from $1.3 million in the first quarter of 1994 to $3.2 million, led by sales of business intelligence software.

BlueLine purchased
Apertus Technologies, Inc. acquired BlueLine Software, Inc. for $8,750,000. Apertus seeks to bolster its lineup with BlueLine's distributed performance management system and software, which configures, monitors and manages IBM MQSeries transaction messaging software. It is due out in September.

Plaintree posts loss
Plaintree Systems, Inc. expects to report revenue of $6.2 million for the quarter ended June 30, resulting in a loss. It blamed OEM partners for not placing end-of-quarter stocking orders or ordering less product than in the previous quarter.

Supply managing a hit
Manugistics Group, Inc. posted revenue of $13.5 million, a 30% increase from the $10.4 million for the same period in 1994. Profits rose 39% to $80,000, from 631,000 in the first quarter of last year. The firm said sales of its supply chain management software led the way, increasing 51% from the same period last year.

SHORT TAKES Digi International, Inc. has agreed to purchase LAN Access Corp. ... Legato Systems, Inc. announced an initial public offering of 2,000,000 shares of its common stock for $19 per share.

Pac Bell sells stake to NEC

$170M cash infusion expected to underwrite push into corporate accounts

By Jaikumar Vijayan

In what appears to be a much-needed cash infusion, Packard Bell Electronics, Inc. last week sold a 19.9% stake to Japanese electronics giant NEC Corp. for $170 million.

The Westlake Village, Calif., PC maker is expected to use the cash to sustain a blistering growth rate that has pushed it to the top of the U.S. PC market in the past two quarters. The cash is also expected to bankroll the company's year-old efforts to build a presence in the corporate market.

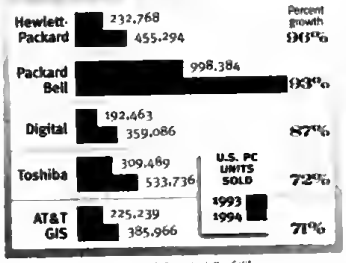
"It gives them low-cost capital to compete more effectively against high-profile, well-funded companies like Compaq and IBM" — not just in the consumer market but in corporate accounts, too, said Richard Zwetchkeobaum, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Despite its status as the PC market leader, the privately held Packard Bell eked out a bare $44 million profit last year, following six consecutive years of losses, according to IDC.

Under terms of last week's agreement, which will be finalized in the next 60 days, Packard Bell and NEC will jointly develop and market a range of consumer electronics products. As part of the deal, Groupe Bull in France, which already held a 20% stake in Packard Bell, will pump an additional $30 million into the company to maintain its stake.

Apart from the cash infusion, the alliance with NEC gives Packard Bell crucial access to critical components and parts such as CD-ROM drives and monitors. For NEC, which becomes the first Japanese vendor to have a major stake in a leading U.S. PC company, the deal could provide a crucial foothold in U.S. retail channels.

Fastest growing PC vendors



Source: Computer Intelligence/InfoCorp, La Jolla, Calif.

For Packard Bell, the alliance comes at a time when the company has been firing away on all cylinders on the home front. For the second time last quarter, the company led its rivals in U.S. PC shipments with approximately 591,000 units, according to IDC. The company completed last year as the fourth largest PC vendor in the world based solely on consumer sales.

Corporate targets

Increasingly, the company has been trying to translate some of that success into the corporate market, too. Last year, it launched a separate division to handle corporate accounts. Last fall, Packard Bell quietly hired Jerry Farmer, a former Compaq director of national account sales, to build a corporate strategy.

Since then, the company reportedly has been aggressively courting major corporate resellers to persuade them to carry Packard Bell products, according to an analyst familiar with the company's plans. It is also building up a service and support infrastructure to provide capabilities such as the 24-hour, 7-day support that many of its rivals supply.

According to at least one source at a major rival, Packard Bell has already begun to make its presence felt in corporate accounts. "Vendors may not be willing to admit this openly, but most major players have already begun benchmarking themselves against Packard Bell. They are becoming the ones to beat" in some low-end corporate accounts, the source said.

ICE 'superstation' to frost rivals with lower pricing

By Jean S. Bozman

It's called ICE, but the little Cambridge, Mass., firm plans to be one of Boston's hottest start-ups by next year.

The $4.5 million Integrated Computing Engines, Inc. (ICE) is putting the finishing touches on a desktop workstation that it claims has supercomputing number-crunching capabilities and a parallel-processing design.

While there are a few competitors, including Mercury Computer Systems and ParSys, ICE's advantage is an emphasis on low-cost desktop systems, said Hubert Delany, an analyst at Gartner Group, Inc. in Stamford, Conn.

Prices will range from $50,000 to $100,000 for 32- and 64-CPU machines, respectively, but may drop to $30,000 as volumes grow, Chief Executive Officer Sundar Subramaniam said. Off-the-shelf Unix workstations that handle high-end graphics cost $40,000 to $100,000, analysts said.

Featuring Analog Devices, Inc.'s SHARC signal-processing chips, ICE's RealTime Engine will provide processing speeds of multihilltoo floating-point operations per second for high-end engineering and financial-simulation graphics. The ICE unit acts as a high-speed server for an attached Unix workstation or PC running Microsoft Corp.'s Windows NT or IBM's OS/2, ICE officials said.

"We call it a superstation because it's a combination of supercomputer performance and workstation pricing," company spokesman Jonas Lee said.

Despite positive feedback on its onique low-cost design, the ICE team must surmount several challenges that have melted other start-ups targeting massively parallel processors. These include porting the systems software to industry-standard operating systems such as Unix and NT and competing head-on with Silicon Graphics, Inc.'s systems, which dominate high-end three-dimensional desktop graphics.

"The No. 1 challenge is software," Delany said. "I think that's more of a challenge than vendor viability." Users will have to adapt their C and C++ applications for the specialized machine, using ICE-provided compilers, executives said.

Delany said the system could find a following among leading-edge users at financial houses, engineering firms and entertainment companies that need personal systems with high-end graphics.

To break into such large information systems sites, ICE must partner with systems vendors and resellers, said Christopher Willard, an analyst at International Data Corp. in Framingham, Mass. "I think it will be very difficult for them to sell their computer with a direct [sales] marketing approach." And to signal future investors about target markets, the firm is considering a port to Digital Equipment Corp.'s Alpha with NT and Digital Unix, analysts said.

Nice slice for ICE

ICE is being bootstrapped with more than $10 million in private funding from MIT and Cambridge Technology Enterprises, which started distributed software firm Open Environment Corp. With systems designed by MIT's Lincoln Laboratory, the 13-person ICE plans to boost its workforce to 40 by December when it first ships systems.

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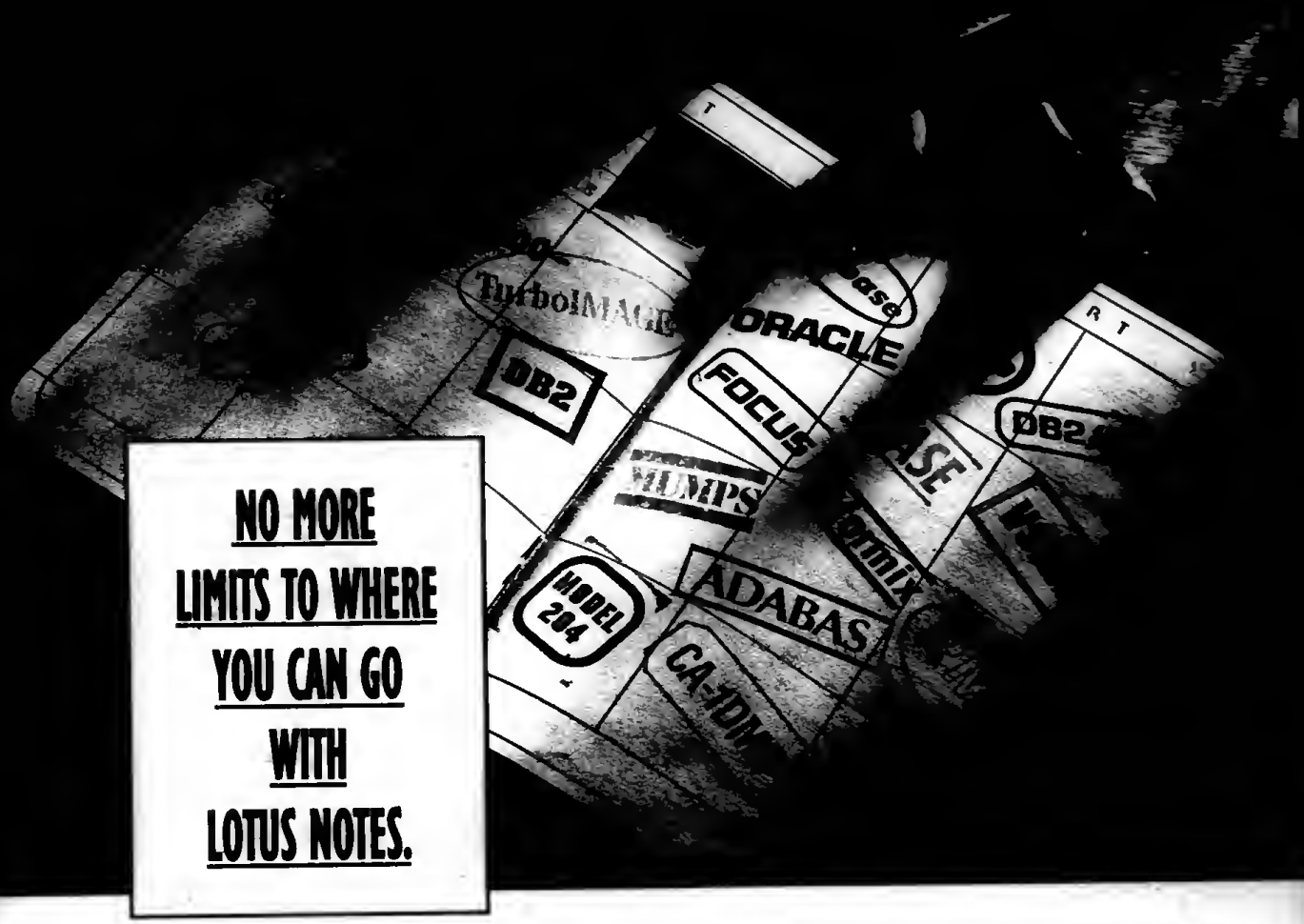
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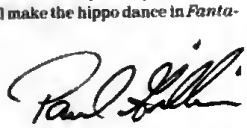
Random thoughts

Miscellaneous thoughts on the first half of 1995:

- If you still doubt that PC hardware has become disposable, consider that next year Microsoft will go to one-year depreciation on new PCs.
- Of all the people I've heard complain about Computer Associates' business practices over the past couple of years, not one has been a CA shareholder.
- I think of Windows 95 as OS/2 Version 4.0.
- Best definition of "legacy system": a system that works.
- The last time I counted, I had 10 phone numbers, seven E-mail addresses and three voice-mail systems. If I play my cards right, I can spend my whole day taking messages.
- Whenever I hear about attempts to regulate information on the Internet, I get this image of King Canute standing at the edge of the sea commanding the tide not to come in.
- IBM's $3.5 billion acquisition of Lotus will go down as one of Lou Gerstner's greatest achievements. You heard it here first.



- Of course, I was also one of the idiots who said Bob Palmer couldn't turn Digital around.
- Who really cares how much money Bill Gates has?
- I spend one-third of my time on the Web trying to find stuff, one-third waiting for screens to redraw and one-third reading useful information. Don't sell your paper company stocks too soon.
- On the other hand, Dow Jones' Personal Journal electronic newspaper is so good that I just might cancel my *Wall Street Journal* subscription. Is that what Dow Jones intended?
- For a great Web belly laugh, check out the Spam Haiku Archive: http://www.naic.edu/~jcho/spam/sha.html
- One of the most unexpectedly useful programs on my PC is Outside In from Systems Compatibility. It lets you view just about any file in its native format. I use it every day.
- And for shareware, check out the $40 MoreMem4 from Gamma Research. It all but eliminates "out of memory" errors.
- An outstanding example of a win-win strategic IS application is Avis' Preferred Customer get-dropped-off-at-your-car-and-avoid-all-the-paperwork service: Customers happily pay $50 a year for the privilege of helping Avis cut its labor costs.
- Wang Laboratories has proved that Chapter 11 can be a miraculous thing.
- Lotus' new WordPro word processor is a good reason to take another look at SmartSuite.
- I used to say you should never buy a software package that's bigger than your head. Now some of it is almost as big as my car.
- I can't wait for telecommunications deregulation. The image of all these local utility monopolies scrambling to compete will make the hippo dance in *Fantasia* look graceful.



Paul Gillin, *Editor*
Internet: *pgillin@cw.com*



Groupware not a Lotus invention

In "Groupware users, vendors split over what it all means" [CW, May 29], I read that Lotus "coined the term groupware" five years ago and that only Microsoft, Lotus, IBM and WordPerfect make up "all the groupware offerings on the market."

I offer this clarification: The term groupware appeared in *Fortune* magazine in 1987. Robert Johansen wrote that Cal Pava at Harvard University and Peter and Trudy Johnson-Lenz at the New Jersey Institute of Technology both used the term freely in the early '80s. Johansen published his pivotal book *Groupware* in 1988. Computer support to teams of knowledge workers has origins in work by Doug Engelbart in the 1960s and '70s.

Project management, workflow, process flow and even simple E-mail and "chat" software are all groupware. But exciting groupware will come with secure, global, open, client/server collaboration and synthesis of cable, satellites, the Internet and the World Wide Web. Groupware is a generic term referring to "specialized computer aids that are designed for the use of collaborating work groups." Thank you, Bob Johansen.

Keely Bruviner
President
Virtual Management, Inc.
Boulder, Colo.
keely@usa.net

What a dilemma

After I read "Over 40, and you're out" [CW, June 26], I felt somewhat depressed. I'm 27. That would mean my career will last only another 13 years. It seems like the only way to secure your future is to either go into business for yourself or at least be an owner in the business you are involved in. Are there any careers in business that do not suffer the same dilemma?

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PCI bests Nubus

In "Apple moves Power Macs to PCI" [CW, June 19], you state that Apple will finally "depart from [its] proprietary Nubus architecture and instead sport the industry-standard Peripheral Component Interconnect (PCI) bus." Nubus is not proprietary to Apple. It was developed independently of Apple by MIT.

This bus allowed Apple to have the "plug-and-play" capability for the past eight years that the Windows/Intel machines will hopefully have before the end of the year with Windows 95 and PCI. It is somewhat unfortunate that the rest of the industry did not pick up Nubus from MIT when Apple did. PCI is better than Nubus, and Apple has now wisely switched to it.

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Don't forget SCO's Open/Server Unix

"Server: Staking out the enterprise" [CW, June 19] made no mention of The Santa Cruz Operation's Open/Server Unix, which runs on Intel and supports symmetrical multiprocessing.

A lot of PC technology has moved to the mini and mainframe world from its PC roots. This includes SCSI and RAID technology. The direct access storage devices on my firm's minicomputer are Seagate and Micropolis. I get the impression the writers have a mainframe mind-set. PC servers may not be the solution for Fortune 1,000 companies, but small and medium-size businesses may find PC servers a robust and cost-effective answer.

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That explains it

A lot is explained about Microsoft's perspective of the world by the following result of using the spell checker in PowerPoint: You enter the word "usability," and it tries to replace it with "suability."

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Australia

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Don't close the door on immigrant programmers

Harris N. Miller

A wise person once said that for every problem there is a solution that is simple, straightforward — and wrong. Reducing the admission of highly skilled aliens to the U.S. because our country cannot control its borders is a prime example.

Immigration reform is one of today's thorniest public policy topics, affecting our country generally and the information technology industry specifically. Concerned primarily about the xenophobia arising from the presence of several million illegal immigrants, the Commission on Immigration Reform released recommendations last month to reduce the number of legal immigrants entering the U.S. from 830,000 to 550,000 a year, including highly skilled immigrants. Immigration legislation that would have the same effect has just been introduced in Congress.



Xenophobic legislation will just hurt U.S. companies that need skilled innovators.

But U.S. immigration laws must recognize that American companies compete globally. Restricting admissions of skilled aliens would be bad economic policy that will just make the U.S. less competitive.

American dominance in both off-the-shelf and customized software development is unquestioned, but not guaranteed. For instance, India has a concerted government policy to train computer programmers and then attract programming contracts there. In just a few years, India has gone from a few thousand programmers to an estimated 250,000.

Software development is very mobile. A modem, a PC, a telephone line and a skilled workforce is all a company needs to move its programming contract from a company in Dallas, Boston or San Jose, Calif., to one in, say, Bombay or Madras, India.

Rules of the game

To be fair, the U.S. must ensure that barriers to the admission of skilled aliens are within the zone of reasonableness to maintain a level playing field. In practical terms, that means guaranteeing that nonimmigrants (temporary workers) enter at market wages, do not undercut U.S. workers' wages and are not used by their employers to compete unfairly. For immigrants (permanent residents), a level playing field means they must enter at market wages after a showing that qualified U.S. workers are not available.

But the Commission on Immigration Reform is simply wrong in worrying that the numbers of skilled immigrant workers entering annually is too high and needs to be reduced. In fact, the business community is not even using the numbers currently allotted to it for skilled immigrants — the ceiling is 140,000 a year, but usage is closer to 120,000. Employers use the permanent categories only to deal with labor shortages, special skills needs or gaining access to foreign markets.

If Congress goes along with the commission recommendations and lowers the skilled worker admissions ceiling (to a recommended 100,000), then skilled immigrant workers will choose other countries, denying their skills to the American companies that need them to compete.

Support innovation

The U.S. economy needs innovations, not ceilings that inhibit entry of innovators. As a nation, we must embrace those who create innovation, regardless of their country of birth. To do otherwise, would only deny the creation of wealth and high-paying jobs in the U.S. and lower the export of U.S. products and services abroad.

During a congressional staff briefing I organized earlier this year on business immigration, one high-tech executive noted that 117 patents — an incredibly high number — had been earned by just three foreign-born employees of his company. Think of the loss to that major employer of U.S. citizens had it not been able to hire those skilled foreign workers!

Protectionism is protectionism, whether the context is trade ("let's protect the U.S. car market"), capital ("let's restrict investment in the U.S.") or immigration ("let's keep out those aliens"). If our country adopts a protectionist immigration policy on skilled immigrants in the midst of a global economy, the American economy, the American information technology industry and American workers will all be losers.

Miller is president of the Information Technology Association of America in Arlington, Va. His Internet address is hmiller@itaa.org.

Better to be the code than the coder

Chris Miksanek

The other day, I was watching a TV show about virtual reality. When I pondered the obvious dilemma of what scenario I would want to play out, I didn't consider the high-level options of, say, managing my way through a maze or battling space invaders. Instead, I traversed the low-level possibilities. I thought how great it would be to be a piece of software for an afternoon.

After zipping around the 100-MHz microprocessor, an experience just short of luge, and possessing the accumulated knowledge of the ages via CD-ROM, I suspect I'd find that it's better to be a piece of software than a programmer for the following reasons:

- Software runs, it doesn't get tired.
- Software is enhanced and maintained. It's been a long time since I was enhanced with some external training, and as far as maintained, I'm ashamed to say when I last saw that dentist of mine.
- Software survives execution.
- Software isn't easily offended. It doesn't wear the silly badge of quasi-sensitivity and doesn't take umbrage by the lack thereof. Crippled shareware, for example, does not prefer to be called functionally challenged evaluation code. After all, in the world of software, PC does not mean politically correct, it just means home.
- Software can handle interrupts. I, on the other hand, am often heard saying, "Now I'll have to start all over!"
- Software is compatible.
- Platforms are still very much in vogue for software. For me, my platforms are in the same crate in the basement as my powder-blue leisure suit and Vicki Sue Robinson disco 8-track tape.
- When software is exploited, that's a good thing.
- Software can ignore snide remarks, taking them in stride so long as they look something like this: REM snide remark.
- Software checks spelling and grammar in real time. I wish I could do that, especially after I've made a presentation sounding like Norm Crosby. And with an on-line thesaurus, software can sound like William F. Buckley Jr. and not simply "spend a day at the beach," but have a "24-hour iteration on the littoral."
- Software has an escape key.
- Software does things WYSIWYG. Of one of my *New Yankee Workshop*-type projects, my 4-year-old said, "I wouldn't bury my dead guinea pig in that jewelry box you made for mom." To which I replied, "It's a spice rack, thank you."



Take a virtual jaunt through the CPU to discover software's true value.

Of course, when the timer pops and it's time to turn in my goggles and get back to the real world, there'll be an incredible urge to step over that line and not come back. I could be there for the next boot and every boot thereafter, until I became obsolete and deleted from my disk to make room for a new program — one that's leaner, faster and has more features. Maybe programmers and the software we write are not so different after all.

Miksanek works as a maintenance programmer at a software development company near Chicago. He prefers to think of himself as a personal trainer for software.

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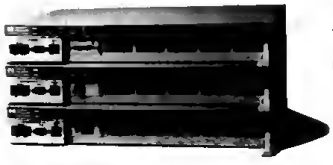
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Desktop Computing

PCs AND SOFTWARE • PORTABLE COMPUTERS

Apple/IBM system a swirl of confusion

By Lisa Picarille

Apple Computer, Inc. and IBM are touting their forthcoming codeveloped Common Hardware Reference Platform (CHRP) as nirvana for users who want a single system that will run up to six operating systems.

But the way things are going, users may need a couple of lifetimes just to figure CHRP out.

IBM and Apple's pre-CHRP activities blurred the picture for many users. There were pre-CHRP PowerPC and Power Macintosh product announcements, joint development on OpenDoc and operating system licensing agreements. This swirl of activity left most users confused about the basics—such as whose hardware will run whose software and when.

"It's very confusing," said Vaughn Hovey, manager of supply management nt Eastman Kodak Co. in Rochester, N.Y., which has thousands of Macintoshes and PCs. "It seems like these companies are just jockeying for position. Basic information and explanation is secondary."

Succesn Iffy

The confusion has other users doubting whether IBM and Apple can pull this off.

"I'm skeptical that it will all work," said an information systems manager nt a large East Coast bank, who nsked not to be named. "If CHRP is what they claim, I'll be delighted, but right now things are so confusing that f plan to just wait and see."

Here is how CHRP is expected to shake out:

- Apple plans to deliver Copland, its next-generation Mac OS, in mid-1996 and is

CHRP, *page 44*

Technologies coming down the pike to strengthen the PowerPC pact

	Apple	IBM
PowerPC	604 and 601 desktops; 604 PowerBooks (this summer)	604 desktops
CHRP	Second half of 1996	Second half of 1996
Operating systems	System 7.5 for CHRP (mid-1996); Copland (mid-1996)	OS/2 for CHRP (late 1996)

'Talking' PC learns syllables

IBM's human-centric interface is evolving—slowly

By Jaikumar Vijayan

IBM's long-awaited "talking head" user interface is finally taking shape.

The company's recently introduced Power Series line of desktop PCs incorporates a suite of Microsoft Corp. Windows NT-based nplications that contain the first elements of n more fully featured and fleshed out human-centric interface.

The software is an attempt hy the company to develop a new, more intuitive way of working with computers.

This includes things such as speaking to the computer and executing voice commands. Software that converts speech into text and vice versa will let the computer talk and respond to user commands. Video and nudio support complete the human-centric feature set.

For now, the interface allows basic speech-driven command nnvigation such as opening and closing files and taking dictation. ft also supports speech responses from the computer.

More fully fentured implementations of IBM's conversational computing technology will include software with intelligent agents that allow the computer not only to respond to voice commands hut to build differing levels of intelligence into the response.

For instance, a request to simply retrieve mail will prompt the computer to ask the user for specifics such as electronic mail, voice mail or on-line mail. Users can also customize the interface to retrieve mail in the same order every time they give that voice command.

A customizable "on-screen" talking head, or "actor," will allow users to create characters and custom vocabularies through which they can communicate with the computer.

"We are absolntely convinced that human-centric technologies of speech and touch are going to be hig drivers" for the products, said Bruce Claflin, IBM's general manager for products and brand management.

The human touch

IBM's new Power Series will be the first to offer a customizable "talking head" interface that will nllow users to do the following:

- Dictate notes and text to the computer.
- Access address books, E-mail, telephone numbers and video and audio clips by voice.
- Receive speech responses from the computer via text-to-speech software.

Not a revolution

For now though, the technology is still evolving, Claflin cautioned.

For example, while IBM'serop of Power Series 830 and 850 snpport basic speech recognition and voice response, a far more robust human interface incorporating intelligent agents is expected hy year's end.

The company is embedding some of these agents intu the operating systems for the PowerPC. In fact, the first really robust examples of intelligent agents will be available with OS/2 for the PowerPC when that ships inter this year, Claflin said. AIX for the PowerPC will also incorporate a limited amount of support for n human-centric interface.

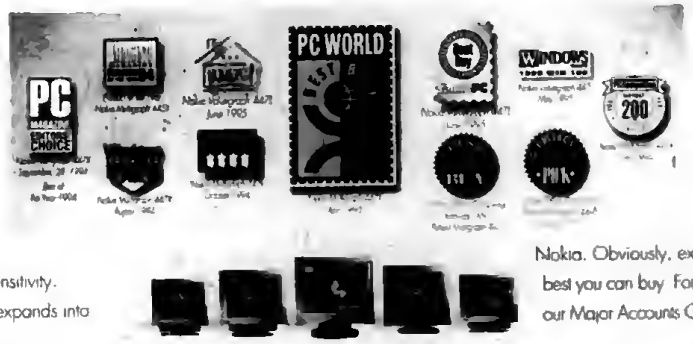
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Jeffrey Henning

IBM/Lotus cornered but still dangerous



IBM's acquisition of Lotus gives the company a chance to do unto Microsoft what Microsoft has done unto it.

Microsoft thrives on changing the rules of the game, creating discontinuities in the marketplace. Microsoft faked to the left with its support for OS/2, then decked IBM with Windows. Also, Microsoft shifted the applications market from stand-alone apps to suites, stealing so much market share from Lotus and WordPerfect that neither company could survive on its own.

IBM and Lotus in combination can turn the tables on Microsoft, if they move quickly. Microsoft is demonstrating that office suites represent a development platform above the operating system. By adding versions of Basic to Word, Excel and Access, corporate developers can more easily build applications on top of these environments. Microsoft makes money off the sale of the operating system and Office.

A leg up?

Now, IBM/Lotus can go this one better.

Imagine that for $99 you could buy OS/2 with Lotus' SmartSuite built in. And by the way all you OS/2 developers, here are the APIs for SmartSuite, so you can build your applications on top of Lotus' 1-2-3, Freelance and Word Pro.

All of a sudden, OS/2 would have a major advantage over Windows. OS/2 would offer incredible features to the developer, making it possible to build higher-quality applications more quickly. And it would cost customers less money.

Face it, the word processor, spreadsheet, presentation package and database belong in the operating system. They're the most common applications and are emerging as object resources for third-party apps.

Microsoft has leveraged its use of Office as a sort of API to encourage customers to purchase Office. Novell and Lotus realize this and are also opening up the APIs of their suites to more developers.

Microsoft has no incentive to build Office into the operating system; it would cost the firm $1 billion in sales. SmartSuite made less than a fifth as much money, and now Novell is grabbing that away. IBM/Lotus have 6% of the suite market and nothing to lose.

Neither OS/2 nor SmartSuite is making enough sales to justify their research and development costs. IBM needs to do something dramatic.

Even if it just breaks even on OS/2-SmartSuite to begin with (there's going to be a lot of disks in that box!), IBM can later look to upgrade those users to NotesSuite and future versions of OS/2 for nice profits. OS/2-SmartSuite is IBM's chance to fight its way out of that corner for both its products.

Decision time

Come August, a lot of corporate users are going to be deciding whether to upgrade to Windows 95 and Microsoft Office. If OS/2-SmartSuite is available, they are going to consider it very seriously.

The migration to Windows 95 is going to be like grabbing honey from a bee's hive. Sweetness is won only after innumerable stings.

If a company is going to switch operating systems anyway, it might as well consider making the switch to OS/2. If the company gets a new suite package for free, then it has an even better reason to switch. If the company sees an impressive growth path in OS/2, well then, that's a switch.

IBM can create an impressive strategy for OS/2-SmartSuite: SmartSuite can become the main object library of VisualAge, IBM's killer Smalltalk environment, which is the talk of the application development community. Longer term, IBM could even build SmartSuite in to Taligent's CommonPoint, for a cross-application framework with incredibly robust objects. So those apps developed for OS/2-SmartSuite could eventually be migrated to all the leading operating systems.

If IBM and Lotus act quickly in the next six weeks, they have a chance to stun the industry again and give Microsoft a black eye for a black eye.

Henning is associate director of personal systems and software publications at BIS Strategic Decisions. He can be reached on the Internet at 649-6654@MCImail.com and on MCI Mail at 649-6654.

Electronic forms are new wave in pollution control

By Julia King

Beginning this month, companies will no longer need to file pounds of paper with Minnesota's Pollution Control Agency (MPCA) to secure the air quality permits they need to do business in the state.

Instead, people like Chuck Hoffman, manager of environmental affairs at Cliffs Mining Services Co. in St. Paul, will be able to get a disk and point and click their way through the agency's new Windows-based electronic permit application form. Then they can store the information on a disk and mail the disk to the agency's air quality division.

When it arrives, the data will be fed into a new client/server-based regulatory compliance management system. That system will eventually process applications for solid and hazardous waste and water quality permits as well.



MPCA's Janet Cain (left) and Shari Wright *are confident that their system is unique and can be deployed in other states*

"This is a huge step for us. Before, this was completely manual," said Janet Cain, MPCA's chief information officer.

The system, known as STAQS (for state air quality system), is a Powersoft Corp. PowerBuilder-based application developed as part of an $8.6 million agencywide automation initiative known as Project Delta. STAQS was developed in conjunction with American Management Systems, Inc. (AMS), a consulting and systems integration firm based in Fairfax, Va.

As part of their association, the state agency and AMS have entered into a rather novel public/private partnership whereby MPCA will receive royalties from STAQS software that AMS sells to environmental regulatory agencies in other states. Neither AMS nor MPCA officials would disclose specific details about how much money the agency could earn from the venture.

On a mission
MPCA has a staff of 750 in five regional offices. The agency's primary mission is to protect the environment and the health of residents in a 94,000-sq.-mile area.

Among other things, STAQS software automatically compares electronically filed permit applications, checking applicants' information against regulatory requirements. The system also provides continuous application tracking, including staff assignments, so regulators and companies can check the status of applications throughout the issuing process.

The agency is also considering equipping its inspectors with laptop computers so they can electronically enter data gathered during on-site inspections directly into the system, said Shari Wright, MPCA's network administrator.

Processing breakthrough

Jeffry Muffat, a regulatory affairs specialist at 3M Co., who recently saw a demonstration of the system, said he expects it to significantly decrease processing time, from three months to three weeks.

So does Cain.

"We truly believe we have a system that is unique in the country and can be used by other states," Cain said. "We saw the partnership with AMS as an opportunity for us to recover some of the costs of our investment."

On the infrastructure side, those costs included installing LANs and 486-based PCs at the agency's five regional offices and headquarters in St. Paul. These are linked to Unix-based servers, which now house the STAQS data in an Oracle Corp. relational database. Eventually, these will also hold other divisions' data.

Cain said the agency has slated April 22, 1997 — Earth Day — as the target date for completing the system, which will include modules for solid waste management, water quality and hazardous waste in addition to the completed air quality module. Then, all divisions' databases will be linked to furnish users agencywide with access to virtually all data concerning all permits, regardless of the issuing division.

Briefs

Canon debuts PowerPC line

In its first major PowerPC announcement, Canon Computer Systems, Inc. recently introduced Power Workstation, a family of desktop PCs and notebook computers based on the PowerPC 604 and 603E processors. The Windows NT-based line includes uni- and dual-processor desktops and ships with 16M bytes of RAM and a 540M-byte fast SCSI-2 hard drive. Prices start at $3,499 for a single-processor system. On the notebook side, Canon's 7-pound PN 100, based on the 603E chip, will ship with 16M bytes of RAM, an 810M-byte hard drive and a 10.4-in. active-matrix screen. Pricing will start at $6,500.

Watcom to add replication

Watcom, the PC database unit of Sybase, Inc., recently demonstrated replication capabilities that it plans to add to the Watcom SQL database late this year.

Unisys awarded contract

Pitney Bowes, Inc., a Hartford, Conn.-based mailing and office systems vendor, recently awarded a $2.2 million, multiyear outsourcing contract to Unisys Corp. Unisys will maintain PCs and networks at Pitney Bowes locations throughout France, Germany, Scandinavia and the UK.



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Apple/IBM CHRP system confusing

CONTINUED FROM PAGE 41

slated to ship its first CHRP system at the end of next year.

But Apple is taking precautions in case there are delays with the hardware or software. Apple does not want to be in the same embarrassing position IBM was in when it recently shipped its PowerPC-based systems minus its own OS/2 operating system, which will not be out until the end of the year.

"We didn't want the hardware and software to be so dependent on each other that we had to wait for both to be done," said Jim Gahle, Apple's director of licensing for common platforms.

To protect itself, Apple is porting the current version of Mac OS (System 7.5) to CHRP. Like Copland, it is also due out in mid-1996. Then if Copland is delayed, users will have a version of Mac OS that will run on CHRP. And Copland's hardware-independent architecture ensures that if Apple's CHRP hardware is late, users can still upgrade and run Copland on pre-CHRP Power Macintoshes.

If all goes according to plan and both Copland and CHRP appear on schedule to user accolades, Apple will simply scrap the version of System 7.5 written for CHRP.

• For its part, IBM plans to deliver its CHRP systems in the second half of next year. Richard Thoman, general manager of IBM's Personal Systems Division, said at last month's PC Expo that IBM will license Mac OS to run on CHRP. Apple and IBM have yet to sign a Mac OS licensing agreement, but the firms said Copland is the operating system IBM will license.



Apple's David Nagle: *The company expects to sign up at least two more Mac OS licensees by year's end*

No regulation

Some observers claim that while the CHRP initiative sounds impressive, compatibility may be an issue because there is no committee overseeing it.

"It's hard to know what's going on because there is no governing body that regulates all this," said Pieter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif. "There is nothing that certifies that each manufacturer's equipment will run everything else."



Sylvia Bates

IBM's Richard Thoman *is negotiating to make IBM one of Apple's licensees*

And while the six operating systems — Microsoft Corp.'s Windows NT; IBM's OS/2 and AIX; Apple's Mac OS; Sun Microsystems, Inc.'s Solaris; and Novell, Inc.'s NetWare — are all expected to run on CHRP, it is still unclear how each will be offered by individual manufacturers.

"Some companies will preload only their own operating systems, and although the machines may be capable of running all these [operating systems], they may not be offered by the box makers," Hartsook said.

He added that "companies will have to decide if this is a religious issue or a business issue. Do they want to cover their asses and protect their fiefdom or get customers to buy more products?"

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Workgroup Computing

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Secure all stations

Bank holding company tightens trading floor passwords, access

By Gary H. Anthes
CHARLOTTE, N.C.

First Union Corp. information systems manager John S. Swanteck has end users as demanding as they come. The good news is that his senior management has given him carte blanche to deal with their demands for ultratight security.

Two years ago, First Union, one of the Top 10 bank holding companies in the U.S., was profitable but stodgy. Then it got into derivatives trading, and it brought in four traders and three Unix workstations to handle that risky but potentially lucrative activity.

Now, the bank's Capital Markets Group has 250 Sun Microsystems, Inc. workstations, 800 PCs and 100 people trading derivatives, currency, securities and bonds for the bank and its customers. Trading accounts for 20% of the bank's profits, and Swanteck said management plans to boost that figure to 50%.

The price of success

With this rapid growth came security concerns, especially about the ultrasecret computer models used to value derivatives that were written by a staff that includes former college professors and rocket scientists.

"The head of the derivatives desk is paranoid about anyone learning how he makes decisions," Swanteck said. "Derivatives traders spend all their time figuring out what something is worth, and the way you make money is by valuing better than others."

A year ago, bank auditors paid a visit to the trading floor and compiled a long list of security flaws. They included poor password control, poor access and process auditing, poor data security and lack of documentation. "There was no security," Swanteck said. "Security was whatever you got out of the [Unix workstation]."

After the audit, Swanteck came into the Capital Markets Group with a mandate to tighten things up. He evaluated a number of security architectures and brought in the Boks Access Control System, an access control, audit and integrity monitoring package developed by Dynamic Software AB in Stockholm and distributed in the U.S. by Securix, Inc. in

Secure, *page 52*



First Union's *John S. Swanteck (left) and Columbus Cooper turned to the Boks system to control derivatives trading*

Novell merges units to speed Super NOS delivery

By Laura DiDio

Novell, Inc. is trying to correct its notoriously long development cycles.

In the past few weeks, the company has made several announcements, including the following:

- It merged its NetWare Systems Group (NSG) and Unix Systems Group (USG) into a single entity now known as the Novell Systems Group. The group reports to Sheldon Laube, Novell's new chief technology officer.
- It unveiled NetWare Connect 2, remote access software that lets remote PC and Macintosh users dial in and out to access all network services.

On its way

NetWare Connect 2.0 remote access package will ship this month in three versions. The two-port version costs $495, the eight-port configuration is $1,995, and the 32-port version costs $5,995.

Laube said the divisional reorganization should accelerate Novell's long-term strategy to deliver its so-called Super NOS technology.

Super NOS is Novell's upcoming umbrella technology for melding the file, print and directory services in NetWare 4.1 with the UnixWare operating system environment, which boasts thousands of mature and available applications.

The decision to fold NSG and USG into a single division streamlines the Provo, Utah, company, analysts said. Novell now has just three divisions: the new Novell Systems Group; the NetWare Applications Group; and the Information Access and Management Group, which contains WordPerfect and other cross-platform applications.

Go fish

"Novell is at the point where they have to fish or cut bait," said David Capuccio, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn. "Lately, it seems they've decided to fish and go after the enterprise [network operating system] business."

But he cautioned that part of the long-term Super NOS technology must include opening up the NetWare Directory Services compo-

Super NOS, *page 52*

NT, NetWare get connected

Novell puts NetWare Client Requester on-line — for free

By Laura DiDio

Novell, Inc. users can now download free software from three different on-line services that will connect NetWare to Microsoft Corp. Windows NT workstations.

NetWare Client Requester for Windows NT Workstations' ability to allow Windows NT workstations to access NetWare Directory Services (NDS) in NetWare 4.x is crucial in mixed environments.

This is because businesses are deploying NT workstations and servers alongside NetWare at many sites, said Bob Sakakeeny, an analyst at Aberdeen Group, Inc., a Boston consultancy.

Connected at last

NetWare users who want to connect to Windows NT Server workstations can do so by downloading the NetWare Client Requester for Windows NT Workstations free of charge

Where: The client requester software is available on the NOVFILES area on CompuServe's NetWire forum, on FTP.NOVELL.COM and via Novell's World Wide Web servers (http://www.novell.com).

What: There are four 1M-byte files in CompuServe that users must download from NOVFILES to have a complete product. They are NTWS1.EXE, NTWS2.EXE, NWADM1.EXE and NWADM2.EXE.

Requirements: A 14.4K-bit modem or higher; download time is about 20 minutes.

He estimated that about 25% of NetWare sites use both NetWare and Windows NT.

Novell has made the NetWare Client Requester for Windows NT Workstations available as a set of four files that are 1M byte each, said Willy Donahoo, the company's director of marketing.

The NT client was designed to support all NetWare servers from 2.x to 4.1, including NDS. With the code, Windows NT workstations can access NetWare basic file and print services as well as the NDS of NetWare 4.x servers.

The NT code also supports the NetWare administrator, a utility that eases network management chores.

Problems encountered

More than 1,000 users have already accessed the files, Donahoo said. But early users who tried to download the Client Requester from the NOVFILES section of the CompuServe NetWire forum got a nasty surprise: the first of the four files — NTWS1.EXE — was corrupted by CompuServe, making it impossible for users to successfully download the file.

The corrupted file generated an error message that said "Program too big to fit in memory." The fix was to redownload just the NTWS1.EXE file.

"CompuServe ran into a problem replicating this particular file throughout the system because it dropped some bytes. This caused the error message when users attempted to download it," said one user who requested anonymity. "The issue was corrected by CompuServe, and the problem is history now."

Joe Mohen, chief technical officer at Prognet Corp. in Mitchell Field, N.Y., a third-party software developer that beta-tested the NetWare Client Requester for Windows NT Workstations, said the software is "stable and reliable."

Two features not included in the initial version of the software are the log-in script capability and the so-called Application Launcher.

The log-in script functionality will be available in 30 to 60 days, Donahoo said.

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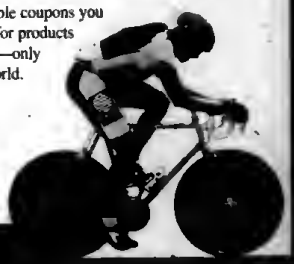
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Middleware facilitates remote banking

Visa helps set up vendor partnerships

By Thomas Hoffman

One of the hottest trends in the banking industry has beeo the surge in electronic banking But until recently, one of the greatest burdles banks faced in delivering "anywhere, anytime" account information services to consumers bas been getting disparate banking systems to talk to each other.

That is starting to change, as savvy banks such as The Chase Manhattan Bank NA begin leveraging middleware technologies to integrate the flow of customer information between business units [CW, June 26]

To aid in this effort, Visa International in May launched n project for its member banks called the Vendor Partnership Program (VPP). To date, Visa has teamed with seven vendors, including Early, Cloud & Co., Tandem Computers, Inc and Braun, Simmons & Co., to offer services to tbe banks.

Choice of packages

Uoder tbe program, the banks can choose from a variety of VPP partner packages, whicb range from Early, Cloud's Message-Driven processor middleware software to Applied Communications, inc 's electronic commerce application software The VPP vendors are expected to provide custom integration of their software so that member banks bave to exert minimal effort to achieve interoperability among systems.

"Banks have layered information systems, and in order for them to provide that data to customers, it's a buge effort," said Brent Robinson, senior vice presideat of Visa Interactive in Herndon, Va. "The use of middleware will lower [data processing] costs for banks and help them get the data out faster in consumers."



Visa's Brent Robinson: *Middleware will lower data processing costs*

VPP was designed to provide consumers with more than credit-card account information, Robinson said. "The goal here is to provide electronic banking customers access to any aqeonnt at the bank, whether it's for deposits, checking or fnvestments," he said. Member banks should be able to provide customers with one-stop shopping by linking tbeir banking systems together with any of the VPP middleware packages.

"Companies like Visa are at the forefront of providing banks with this [electronic] channel," said David Medeiros, a technology analyst at The Tower Group in Wellesley, Mass.

"One of the largest areas of concern in the banking industry is 'How do we stay at the leading edge of this transition from face-to-face banking to home banking and banking by phone?'" Medeiros added.

So far, Visa has gotten commitments to join the program from 50 member banks, including NationsBank in Charlotte, N.C., First Tennessee National Corp. in Memphis and Zions Bancorp in Salt Lake City.

Zions, for example, is working with Braun, Simmons to develop an electronic banking system. "The benefit I see is bringing in someone with the expertise of a Braun, Simmons to get this [project] moving," said Dan Buchanan, president of Zions Data Services Co. Buchanan said he expects the bank to have such a system in place by October.

Jean S. Bozman

Survival of the fittest



Unix vendors planning to field all manner of hardware and software commodity platforms this year and next will find themselves in the thick of Darwin's survival of the fittest.

Vendors sncb as IBM plan to offer a smorgasbord of operating systems for their RISC chips In hopes of making them a widely used commodity.

For users, this mix-and-match concept has a powerful appeal. It promises to reduce system costs dramatically through volume sales, bringing RISC systems in line with PC pricing.

Users got a taste of the commodity-system smorgasbord when IBM introduced its Power Series line of personal workstations last month. All the entries were based oo the PowerPC chip, but a sampling of operating systems, including Microsoft's Windows NT, Sun's Solaris Unix, OS/2 and, eventually, Apple's Mac OS will be offered.

Being able to mix and match should break whatever hold hardware vendors may have on their installed base. No more user lock-in. That's what open systems is supposed to be all about.

Unfortunately, economic reality will likely dictate otherwise.

Analysts predict that the only real battle for top dog in mass-market processors will be won by two adversaries: Intel (along with its partner Hewlett-Packard) and the PowerPC coalitioo formed by IBM, Apple and Motorola. By 1999, in reaction to those market forces, many of today's Unix RISC vendors will bave added support for Windows NT and volume chips into their desktop workstations and low-end servers, industry observers predict.

Darwin enters the picture as users pick and choose among the many workstations and departmental servers built on commodity chips.

Application availabibty will also drive the Darwinian engine for operating systems, as independent software vendors balk at the notion of supporting too many hardware/software combinations for low-end and departmental server computing.

"There will be one or two winners on PowerPC," says Tony Iams, a research analyst at D. H. Brown Associates in Port Chester, N.Y. "It's good to have choices, bnt realistically, it makes things less complicated if you settle on a few well-known market standards on PowerPC." Windows NT will be a sure winner, as will one or two Unix variants — Solaris and AIX — for enterprise, database and engineering applications, Iams says.

Chip away

Andrew Allison, an independent analyst in Carmel, Calif., says Unix and RISC chips will still cost more than Intel or PowerPC cbips That premium price will drive them toward the high-end but lower-volume markets for database systems and enterprise-level servers.

One advantage still held by RISC chips such as Sun's SPARC, Digital's Alpha and Silicon Graphics' MIPS chips is their upcoming move to 64-bit operating systems by the late 1990s. That will allow them to act as powerful data warehouse search engines.

Still, the only way Unix vendors will benefit in the industry's new world order is by selling those commodity wares themselves. Digital, HP and IBM bave sizable PC server businesses and are well positioned to provide NT or Unix-on-Intel servers when the time comes. Regardless of what chip powers the system, Unix vendors may be forced to focus on what they do best: high-end, scalable enterprise computing.

Bozman is *Computerworld*'s senior editor, open systems. Her Internet address is jbozman@cw.com.

Notes users can swap data with NT, OS/2 databases

By Suruchf Mohan

Percussion Software, Inc. has introduced Notrix Composer 2.0 and its Notrix fourth-generation language programming tool for Microsoft Corp.'s Windows NT platform. Until now, the products had been available only on OS/2.

Notrix Composer is a bidirectional data integration tool for Notes. This means Notes users can exchange data with users on other databases.

Notrix Composer 2.0 also offers more features. For example, Version 1.0 offered direct drivers to only four databases — Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase and SQL Server and IBM's DB2/2 — with gateways to other popular databases, said Barry Reynolds, president of Percussion in Stoneham, Mass. The product offers connectivity to virtually all databases through Open Database Connectivity and direct drivers.

This offers a more enterprise-wide approach to Notes than has been available so far, said Sally DeJean, senior contributing editor of "The Notes Report" newsletter in Boston. Users can be selective and synchronize data across different platforms. They will need initial setup — a physical link between the databases — but after that, it is easy to manage, she said.

Notrix Composer 2.0 also offers Notes-to-Notes data transfer. This lets users easily archive infrequently used data.

This function could be performed earlier but was complex and cumbersome. This product automates the process and offers selective archiving.

Notrix and Notrix Composer are available now.

Brainstorm advances

Competitor Brainstorm Technologies, Inc. in Cambridge, Mass., has announced the DataLink 2.0 family of products, which provides connectivity and data migration between Notes and different platforms.

The DataLink family of prodoets consists of Lite, Standard and Server editions DataLink 2.0 Lite addresses the personal information store and databases; DataLink 2.0 Standard edition addresses corporate client/server databases; and DataLink 2.0 Server edition will connect Notes databases to OS/2 and Windows NT.

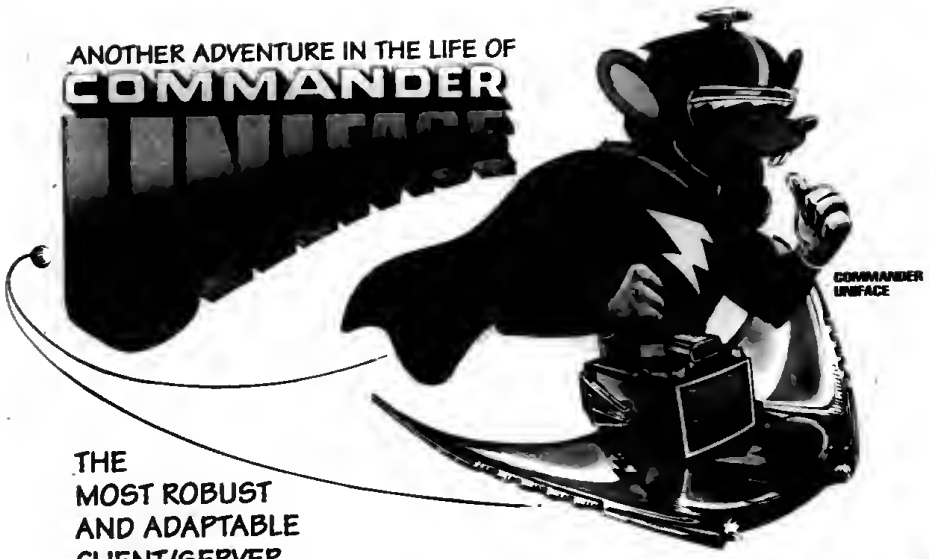
The Lite and Standard editions are client-based, the Server edition is client/server-based

Two important new features in Version 2.0 are the ability to support data migration and connectivity between any two Notes applications and the ability to propagate deletions of data, not just additions and updates, said Mitchell Liu, vice president of marketing

DataLink Lite and Standard are available immediately for $495 and $1,495, respectively. The Server version for OS/2 will be available this month, and the NT version is expected in August. Pricing will start at $3,995.

ANOTHER ADVENTURE IN THE LIFE OF

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Safety on the 'net

While First Union's John Swanteck tends to the security of the bank's Unix boxes, Columbus Cooper, a vice president of the Capital Markets Technology Division, deals with network security.

Cooper employs multiple layers of security to block intrusions from the outside, including data packet filtering routers, a gateway configured with the Gauntlet firewall software from Trusted Information Systems, Inc. and Firewall-1 software from Checkpoint Software, Inc.

"We try to protect at every level as if no other security was there," he said.

Cooper acknowledged that he may have taken security precautions further than absolutely necessary. "But because we are a bank, we have to be extra cautious," he said.

"We have to be concerned with the professional [criminal] who may target us for significant financial gain."

—Gary H. Anthes

Secure all stations

CONTINUED FROM PAGE 47

Burlingame, Calif.

Swanteck picked Boks because he found it easy to install and remove, and it did not require modification of the Unix kernel and does not degrade performance.

Swanteck's search for security was also driven by First Union's application to the Federal Reserve System for permission to issue corporate bonds, something banks are banned from doing by law.

To get an exception to the ban, the bank must show that its systems insulate depositors from the risks of its trading business, among other things.

Getting the nod from the Federal Reserve was so important to the bank's long-term growth strategy, and systems security was so vital to the Fed's approval, that Swanteck was able to sidestep a hurdle that IS managers often face — convincing their bosses there is a measurable payoff from computer security.

"The attitude was, we want these guys to be real comfortable," Swanteck said. "We bought security, but we bought a perception as much as real security, and that may have been more important."

Whether it was the appearance or the reality of security, it evidently paid off. Two weeks ago, First Union won final approval to issue corporate bonds.

[redacted]

Concepts Dynamic, Inc. has released CDI Control Series 6.0, a suite of client/server financial applications.

According to the Schaumberg, Ill., company, CDI Control Series 6.0 is a suite of corporate accounting and project financial management applications that provides high-transaction volume processing power and improved extensibility to external applications.

CDI Control Series 6.0 includes CDI Financial Control System, a set of integrated accounting modules, and CDI Project Control System, a set of project management modules.

CDI Control Series 6.0 runs on any Unix-based computer with Informix Software, Inc.'s Informix-OnLine or Informix-SE database engines. It also supports the Informix-SE database running on Microsoft Corp.'s Windows NT Server.

Pricing for CDI Control Series 6.0 starts at $22,500 per module and is based on the number of users.

▶ *Concepts Dynamic*
(708) 397-4400

Clarify, Inc. has announced the Clear Enterprise Replication Engine, customer service software.

According to the San Jose, Calif., company, the Clear Enterprise Replication Engine replicates customer support data on multiple distributed servers. Users can transfer customer information to another server site and collaborate simultaneously on a case.

The Clear Enterprise Replication Engine costs $20,000.

▶ *Clarify*
(408) 428-2000

LTC has announced Telcom Fax 3.0 for Windows NT, fax communication software.

According to the Syracuse, N.Y., company, Telcom Fax 3.0 includes print-to-fax drivers, user definable folders, multiple telephone books, cover page graphics, autoprint on receipt, scheduling features and connection with Microsoft Corp.'s Mail.

It also includes an autoprint feature that routes received faxes to a printer. It was designed to allow the simultaneous use of several fax modems.

Telcom Fax 3.0 costs $219.

▶ *LTC*
(315) 673-0120

Super NOS delivery

CONTINUED FROM PAGE 47

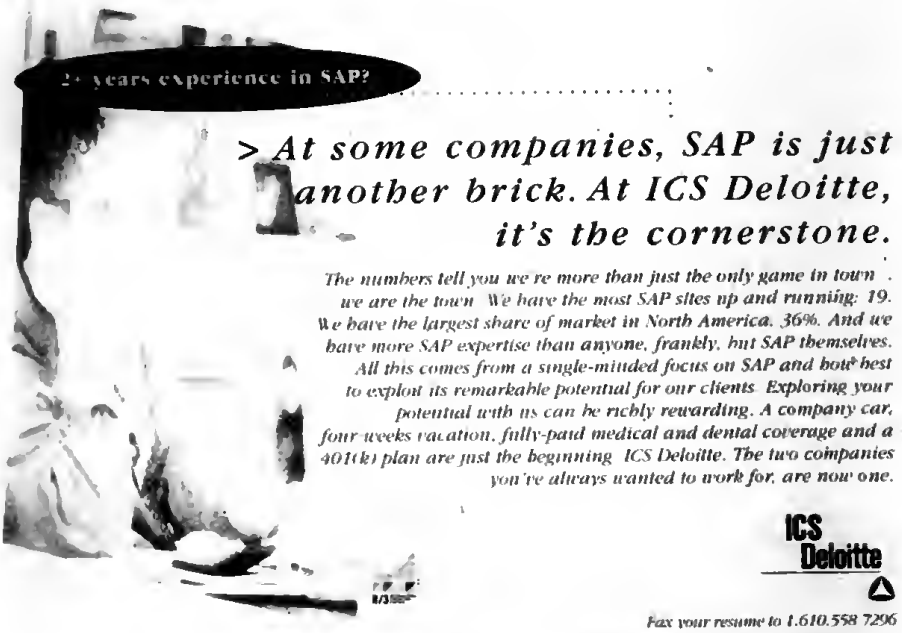
nent to support other platforms, most notably Microsoft Corp.'s Windows NT Server.

Capuccio said Novell is making the correct and necessary moves to position the company beyond being a supplier of NetWare's basic file and print services. The NetWare Connect 2 software, a NetWare Loadable Module for NetWare 3.x and 4.x LANs, allows up to 128 local and remote PC and Macintosh users to dial in and out to access network resources and on-line services simultaneously.

Fan of release

One beta tester, Derrick DeCarlo, vice president of operations at Safenet Corp. in Atlanta, lauded NetWare Connect 2's ability to centralize all of his company's communication services on one machine.

"NetWare Connect 2 will enable us to link all our remote mail, remote communications and faxes through a single device. So, we can deploy a single server with several modems on it and use it for multiple functions," DeCarlo said.



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THE FRONT PAGE
NETSCAPE, SPRY INTRODUCE BROWSERS FOR WINDOWS 95, 58

Enterprise Networking

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Chipcom ships ATM management app

By Bob Wallace

Chipcom Corp. is shipping a software management application that will enable network administrators to analyze and manage the vendor's recently announced Asynchronous Transfer Mode (ATM) products.

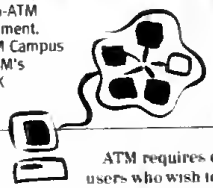
The application, called Ondemand ATM Campus Manager, provides centralized configuration and fault and performance management of physical and logical ATM resources from one workstation. This includes ATM virtual connections, which are communications channels that carry traffic between user devices.

Based on the Open Software Foundation's Motif or X Window System graphical user interface, the package lets network managers monitor and control every segment of every hub down to the port level, which is especially useful when users are trying to pin down problems.

■ Chipcom's new Ondemand ATM Campus Manager monitors and manages its:
- Oncore 10M bit/sec. module for interswitch fiber links.
- ATM Switch/Control Point module.
- Onsemble ATM Workgroup Concentrator.

■ Ondemand ATM Campus Manager currently runs on IBM's NetView for AIX and will run on Hewlett-Packard's OpenView platform later this year.

■ Ondemand ATM Campus Manager can run as a stand-alone application or integrated with Ondemand NCS, which is used to manage non-ATM Chipcom equipment. Ondemand ATM Campus Manager for IBM's NetView for AIX costs $7,995.



Apprehensive users

Chipcom users said they remain wary of using a product without robust network management to monitor and control ATM products.

"We're looking hard at ATM to support an imaging application that needs more than the dedicated 10M bits we provide today. But without being able to manage the Chipcom products, we couldn't guarantee the ease of use and reliability that we have now," said Barry Gillespie, communications supervisor at St. Jude's Children's Research Hospital in Memphis.

The hospital currently uses only Chipcom hubs, including its high-end Oncore Switching System.

"We need ATM's bandwidth because with shared 10M bit/sec. Ethernets we have to schedule image transfers for off-hours when the LAN isn't being heavily used," Gillespie explained. "We would need to see how [application] performance would be affected using ATM switching."

Net management

Industry analysts also expressed concern about companies using ATM products without ATM network management in place.

"Network management is an absolute requirement for ATM, largely because ATM is a new technology that few users are familiar with," said Michael Howard, president of Infonetics Research Corp. in San Jose, Calif. "ATM is connection-oriented, while today's shared LANs are connectionless in nature. That difference makes network management all the more important."

ATM requires connections between every two users who wish to share data, while legacy LANs such as Ethernets do not.

Firm to offer free 'net mail

By Surmeet Mohan

Interested in free access to Internet electronic mail? A Cambridge, Mass., company may have just the deal for you — provided you don't mind a heavy dose of commercialism with your E-mail.

FreeMark Communications, Inc., last week announced it will not charge users for access to the Internet for mail, and later, to a variety of on-line services. The E-mail service — a first for the computer industry — will be available this fall.

Nicholas Negroponte, director of the Media Lab at MIT and chairman of FreeMark's media advisory board, said, "I think we have just assumed that the unreal economic model of the Internet would just magically continue. Well, it cannot. [FreeMark's approach] means more business, paid differently."



FreeMark's E-mail service *will be paid for by interested users.*

"This is a different business model," said Peter Krasilovsky, a senior analyst at Arlen Communications, Inc. in Bethesda, Md. "FreeMark hopes to take advantage of the most popular on-line service — communications."

We will offer a full range of on-line services completely free to the user and have advertisers pay for it all," said Robert Young, president of FreeMark, which was formerly called ProductView Interactive, Inc. In turn, advertisers will be able to track who is interested in their advertisements.

How it works

For now, FreeMark is an off-line E-mail service. When users sign on, the company asks for name, age, address and gender. In return, customers are given a mailbox on FreeMark's domain such as JohnDoe@FreeMark.com.

When mail comes in, users see an envelope on the screen with a digital stamp that bears the advertiser's icon. Users double-click on the envelope to read their mail. To receive more information on the advertiser, users can click on a banner at the bottom of the E-mail message. This takes them to another screen with information on the advertiser.

Advertisers pay only after FreeMark has tabulated how many readers have seen the message. FreeMark collects all the information in a database and sends it to the advertisers along with the demographics of the users — enabling advertisers to use the information to target specific groups.

Andrew Pakula, executive vice president and general manager of InterActive Marketing Agency in New York, said this pricing structure makes sense because it gives advertisers much-needed accountability. It also gives them a good idea of the amount of traffic and exposure their advertisements receive.

While this sounds like a winning situation for everyone, it remains to be seen whether the commercial/retail world will appreciate a service such as this, Krasilovsky said. "Will they pay the high prices? The litmus test will be the first six to seven months [in which FreeMark] will provide low-cost sponsorships. They will have to show direct results."

Overall, Krasilovsky said he is "pretty gung ho" about the product. "I'm just concerned that the novelty of the product will make it underappreciated on the market."

Wireless communications

Giants jump into wireless fray

By Mindy Blodgett

IBM and Digital Equipment Corp. are getting into wireless networking, and all boats may rise with the tide, some analysts say.

"IBM and DEC bring a name," said Iain Gillott, an analyst at Link Resources Corp. in Framingham, Mass. "IBM brings exposure and attention to the wireless world. In the short term, it helps everybody."

IBM is set to announce the U.S. release of ARTour, a client/server middleware product that allows TCP/IP-based applications to run over wireless networks without modification.

Recently, Maynard, Mass.-based Digital announced Mobilizer for Windows, a client software product that allows connection to the office LAN over traditional lines and wireless networks.

Wireless communications software products are aimed primarily at application developers and integrators. The middleware market, software that provides interoperability among incompatible proprietary wireless networks, has been largely dominated by small companies such as Racotek, Inc. in Minneapolis, MobileWare Corp. in Dallas, Airsoft, Inc. in Palo Alto, Calif., and Complex Architectures, Inc. in Wakefield, Mass., which was bought this year by Sybase, Inc.

Key features of Digital's Mobilizer for Windows

- Lets remote users view network directories and move files on line as though connected
- Once work is done, it reconnects users to the network and updates files without forcing users to establish a new session
- Allows users to connect via telephone lines or wireless connections, including cellular or radio

Here come the giants

But in the past year, several giants that have operated in the wired world have entered the fray.

For instance, Digital's Mobile Software Business group recently launched Mobilizer for Windows 1.0, which gives users access to electronic mail, database and LAN systems through a single client interface.

Digital said it will start beta-testing this month and hopes to ship the product in the fourth quarter. Single-user versions of Mobilizer for Windows 1.0 will cost $299.

Labor Day in Tuktoyaktuk?

In the hard-to-audit sphere of World Wide Web server hits, some vendors are using contests to prove you visited their home page

By Ellis Booker

Management enthusiastically endorsed the World Wide Web project months ago. But lately they have begun to ask, "Is it working?"

Gauging the effectiveness of a Web presence is emerging as one of the biggest challenges for information systems executives and their counterparts in the marketing communications department.



Molson is offering *Web visitors a chance to win a weekend in the Arctic*

Pundits of Web marketing now agree that using the number of "hits" a server receives to judge its popularity is a badly flawed technique.

"It's the most meaningless thing in the world because you don't know who is there or why they are there," said Daniel Janal, author of the just published *Online Marketing Handbook*. Janal said hits are a dubious metric because the number of hits may not be equivalent to the number of users entering a site. One user can access a server multiple times, causing multiple hits.

"Hits are totally unauditable," Janal said. "If some digital mall says it gets 100,000 a week, you don't know if that's verified." Advertisers, he added, will continue to be wary of the Web until auditing systems are available.

Indeed, prompted by this need, television ratings giant A.C. Nielson in New York, along with ASI Market Research, Inc. in Stamford, Conn., and Yankelovich Partners, Inc. in Norwalk, Conn., recently announced the Anywhere Online alliance to bring auditable measures to the Web. A few standalone systems for analyzing Web traffic have also appeared in recent months.

On-line promotions

Meanwhile, as tools for monitoring Web traffic evolve, those with Web pages are doing what they can.

"In our case, it's a contest entry form," said Bruce Wolterton, brand director for Molson Ice at Molson Brewers USA in Reston, Va. The entry form, part of Molson's giant Polar Beach Party promotion, gives visitors a chance to attend a Labor Day party in Tuktoyaktuk, a tiny town north of the Arctic Circle.

The Internet's biggest contest — and user registration drive — is being launched this week. CompuServe, Inc. will start its $1 million Internet Hunt on July 14. Users will have to register to participate in the scavenger hunt, which runs through Oct. 27.

At Holiday Inn Worldwide, Inc., Les M. Ottolenghi, director of emerging technologies, said he already knows that the Web-attached reservation system, up since May 30, is busiest between 8 a.m. and 10 p.m. Eastern Standard Time and that most of the hits come from North America.

Ottolenghi and others are able to do some gross demographics on their Web traffic because of the way Hypertext Transport Protocol (HTTP) servers and Hypertext Markup Language browsers interact. When a browser logs in to an HTTP server, a number of its attributes — such as domain name and platform — are logged.

Jang Jeon, director of electronic marketing at Fidelity Investments in Boston, said he believes that while server hits are not the ideal metric, they can still help inform a Web site's creators.

"You can look at your own hit data many ways and monitor it over time," he said.

For instance, Fidelity, which has logged 2.5 million hits since its site went up Feb. 14, knows that most visitors to its server have been coming in during the week — presumably from work — but that an increasing number have begun to arrive on the weekends — presumably from home.

But many users are put off by on-line registration, contended Kenneth Hill, manager of electronic communications at Dell Computer Corp. in Austin, Texas. For that reason, the PC maker is busy building a version of its Web site that will dynamically assess demographics about visitors, depending on how they navigate through the Web.

"After three or four clicks, and without reading your TCP/IP or domain name, we'll be able to tell a lot of things about people entering our site," Hill said.



Bean counters

The following tools help find out how effective a Web site is:

NetCount, a system for tracking consumer use of a Web site, from Digital Planet. (http://www.digiplanet.com:80/DP/)

I/Count, a tracking and analysis service for the Web, from Internet Profiles Corp. (http://www.ipro.com:80)

Netscape, Spry introduce browsers for Windows 95

By Ellis Booker

Windows 95 users now have two Internet browsers to choose from.

A few weeks ago, Netscape Communications Corp. made a Microsoft Corp. Windows 95 beta version of its popular Navigator browser available from its World Wide Web home page.

Even more recently, CompuServe, Inc.'s Spry/Internet Division announced that its Windows 95 client would be available through its usual retail channels in August.

Both companies, leading makers of browser software for cruising on the Web, claimed their 32-bit browsers would be superior to what Microsoft is expected to offer as an add-on to Windows 95.

"When Win 95 ships in August, it won't include a browser," said Richard Ting, director of product marketing at the Spry unit. He added that the browser software companies have been working on a product far longer than Microsoft has.

Microsoft earlier this year licensed the Enhanced Mosaic code from Spyglass, Inc. in Savoy, Ill. Spyglass holds the master licensing rights to Mosaic, the Web browser developed at the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign. Microsoft will distribute the browser separately from Windows 95, as part of the Plus Pack.

"People can download the NCSA Mosaic today," said Dave Rothschild, director of marketing for Netscape's Navigator.

He noted that Netscape first introduced Navigator last December, issued a second release in April and last week finished its Windows 95 beta.

No monopoly here

Victor S. Wheatman, a director at Gartner Group, Inc. in Stamford, Conn., said the hope is that products from Spry, Netscape and others will be "sufficiently sophisticated that users will prefer them to what may be a relatively barebones product from Microsoft."

The familiarity factor is going to be important, too, said Hank Coleman, president of Twenty20 Visual Systems Corp., a systems integrator in Dallas.

"Users will use what they like, not just because Microsoft provides it," he said, adding that he felt there was plenty of room for generic and high-end browsers.

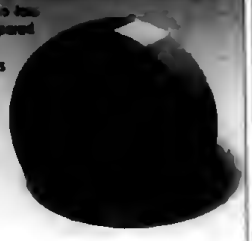
Netscape's Navigator 2.1 Windows 95 browser is available in beta form at Netscape's home page (http://home.netscape.com). The supported software will cost $39, Spry said. Its browser will be available in August for $9.95.

Psychobabble

...greater split in Generation X years. Although data is less dramatic than earlier estimates, it is still large compared with the 49/51 ratio in the overall U.S. population. The survey results are available on SRI International's home page (http://future.sri.com).

The following is a breakdown of the types of Web users:

Actualizer	50%	Fulfilled	11%
Experiencer	18%	Achievers	6%
Striver	15%	Believers	2%



Actualizer:	Highly educated, innovative, eclectic, at the forefront of adopting new technologies
Experiencer:	Impulsive, spontaneous, creative, rebellious, trend conscious
Striver:	Eager, social, approval seeking and image conscious
Fulfilled:	Organized, self-assured, intellectual, analytical, highly information intensive
Achievers:	Stable, upscale, well-educated, family-oriented, brand conscious, enterprising
Believers:	Practical, cautious, conservative

Source: SRI International, Menlo Park, Calif.

On March 28, 1989,
Lefty Korker, Jr.
cocked his bat, spat
and waited for the 3-2 pitch
in the bottom of the ninth.
The fate of the season
came down to this.
The ball flew toward him.
Lefty let it go by.

"Strike three!"

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and expressed his appreciation
for persevering
with a difficult
and thankless job.



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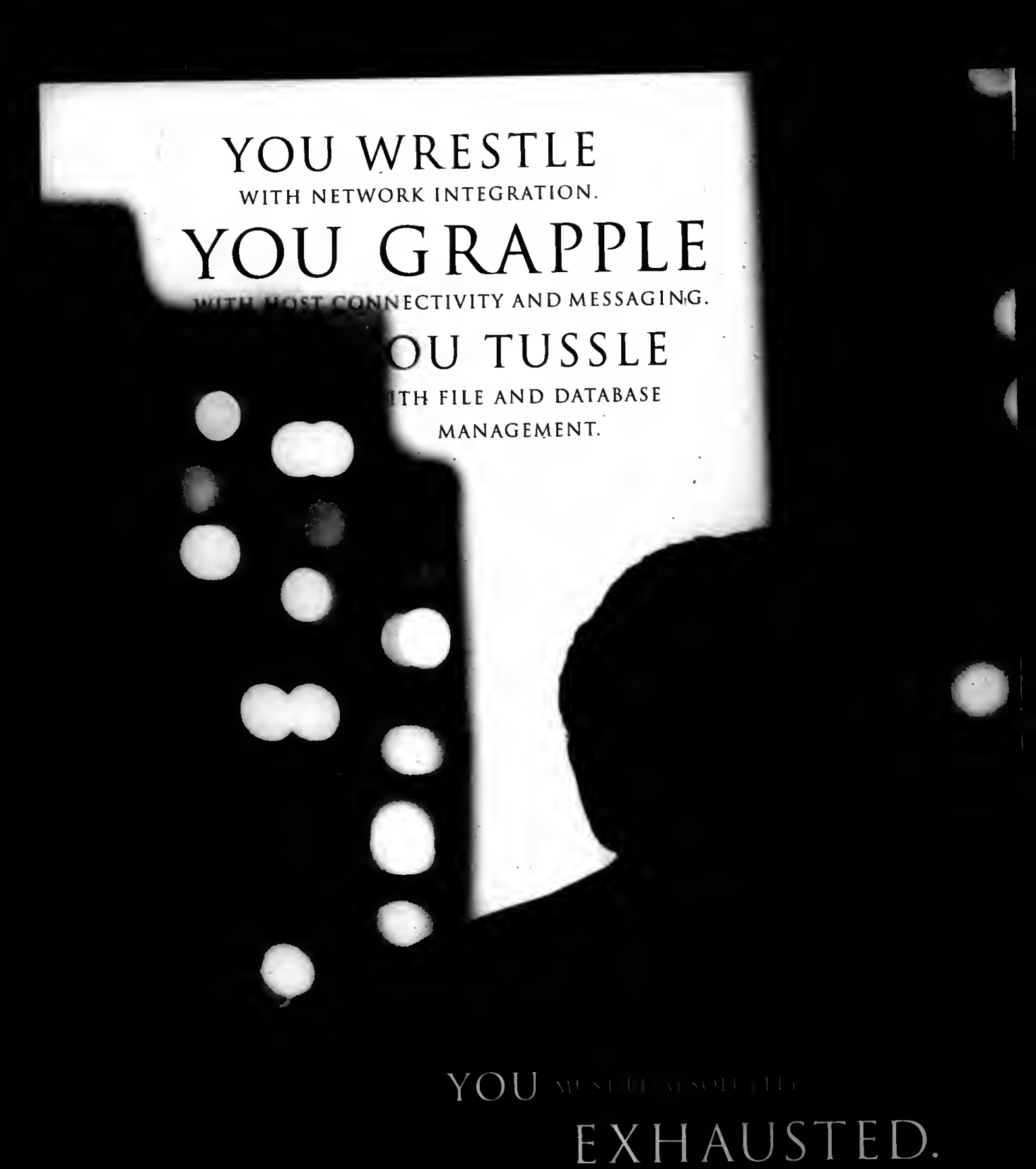
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Imagine what you could do with an integrated information system.

You could finally break free of clumsy business systems. You could respond more quickly to changing business needs. You could enable the people you work with to get the information they need. So they can make better, smarter decisions.

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Microsoft Windows NT Server: *The network foundation for a new generation of business applications. It is a multipurpose network operating system that can deliver application server capabilities without compromising file and print service performance.*

Microsoft SQL Server: *The high-end database platform at the center of a complete client-server architecture for information management.*

Microsoft SNA Server: *Makes it easy to connect PCs to IBM mainframes and AS/400s.*

Microsoft Mail Server: *The heart of a complete messaging system that makes it easy to communicate with anyone, anywhere.*

Microsoft Systems Management Server: *The most comprehensive solution for managing networked PCs.*

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Remote access software

Citrix Systems introduces WinFrame for Networks

By Mindy Blodgett

Citrix Systems, Inc. claims that its WinFrame for Networks software gives remote users access to any Windows application — regardless of the size of the PC or the type of operating system.

Most remote control programs are designed for PC-to-PC connections. By contrast, WinFrame for Networks can support hundreds of users who are simultaneously dialing in to a remote access server.

WinFrame incorporates Microsoft Corp.'s Windows NT Server technology with Version 3.0 of Citrix's own Intelligent Console Architecture. Citrix, in Coral Springs, Fla., said this setup gives remote users full access and provides network administrators with security and administration capabilities.

Looking for the best

Mark Resh, chief information officer at Standard Forms, Inc. in Norfolk, Va., a business forms supplier, said that with 30 remote sites, his company was looking for remote access software a cut above the rest.

"With other remote software, you have to have each site coded to hit a certain box," Resh said. "With WinFrome, we have something that is seamless to the users under Windows NT. You would need to run T3 circuits costing about $250,000 a month to get the capabilities we are getting with this."

Easier administration

Joyce Gavenda, an analyst at Summit Strategies, Inc. in Boston, said "the appeal of this product is that it is much easier to administrate on the server than on the desktop."

WinFrame for Networks will be available in September. An application server with Windows NT that supports 15 users and client software will be available for $5,995. Users in multiples of 10 can be added for $1,995.

Come to my Window

Features of Citrix's WinFrame for Networks include the following:

- Allows users to access Windows and DOS applications locally and remotely at Microsoft's 32-bit Windows NT speeds.
- Supports various connections, including wide-area network links, Internet or telephone lines.
- Performs systems administration from any local or remote PC.

Support for all

Most remote control programs are designed for PC-to-PC connections. By contrast, WinFrame for Networks can support hundreds of users who are simultaneously dialing in to a remote access server.

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Scope Communications, Inc. has announced the WireScope 155 cable analyzer for testing Category 5 twisted-pair cabling.

According to the Northboro, Mass., company, WireScope 155 is the first Category 5 cable analyzer that operates up to 155 MHz. By measuring cable performance up to 155 MHz, it provides accurate qualification of installed cabling for use with 155M bit/sec. Asynchronous Transfer Mode equipment. It includes an intelligent test port interface.

Pricing for WireScope 155 starts at $4,995.

▶ *Scope Communications*
(508) 393-1236

SunSoft, Inc. has announced SolarNet PC-X 1.1, a high-performance X-Server for Windows.

According to the Mountain View, Calif., company, SolarNet PC-X 1.1 delivers VxD-based TCP/IP protocol stack with support for the WinSock 1.1 interface for application compatibility. It supports Point-to-Point Protocol for remote TCP/IP connectivity and also allows network administrators to install and configure SolarNet PC-X 1.1 clients automatically from a central location.

The product includes a Telnet application that provides VT320 terminal emulation for text-based communication with remote host computers.

SolarNet PC-X 1.1 lets users access business-critical applications running on Sun's Solaris and other Unix systems through a point-and-click interface. It provides users with full network access from their PCs on the LAN in addition to dial-up modem access from remote locations.

SolarNet PC-X 1.1 costs $199. Volume pricing licenses are also available.

▶ *SunSoft*
(415) 960-3200

Ascend Communications, Inc. has announced Pipeline 25, an Integrated Services Digital Network (ISDN) remote access bridge/router for telecommuting and Internet access.

According to the Alameda, Calif., company, Pipeline 25 connects one or more workstations on an Ethernet LAN to an ISDN Basic Rate Interface line for digital connections at rates up to 128K bit/sec. It also has two analog ports that allow users to connect standard telephones, fax machines, modems and answering machines to Pipeline 25 and place and receive calls over the ISDN line.

Pipeline 25's base configuration includes full bridging capability. Other available options include IP and IPX routing and 4-to-1 data compression.

Pricing for Pipeline 25 starts at $895.

▶ *Ascend Communications*
(510) 769-6001

Madge Networks, Inc. has announced the Smart 16/4 ISA Client PnP Ringnode, a Token Ring XT/AT bus Plug and Play adapter card.

According to the San Jose, Calif., company, the product ships with Madge Smart Software and offers DOS memory savings that let users balance their needs to run multiple applications with optimal network performance. It works cooperatively with other parts of the Plug and Play system to automatically configure all PC components and avoids clashes among adapter cards.

Pricing for the Smart 16/4 ISA Client PnP Ringnode starts at $295 for a single pack. Multiple-pack pricing is also available.

▶ *Madge Networks*
(408) 955-0700

Sterling Software, Inc.'s Operations Management Division has introduced Solve:Attach 1.1 for SNMP, a network management application.

According to the Reston, Va., division, Solve:Attach 1.1 for SNMP allows users to administer all or part of their Simple Network Management Protocol (SNMP)-controllable environment from the mainframe. It lets users diagnose and troubleshoot SNA and SNMP-manageable networks from a single terminal.

With this capability, users can monitor the health and status of SNMP elements, receive alerts and diagnose and solve problems.

Solve:Attach 1.1 for SNMP also allows users to manage end-to-end connectivity across multiprotocol network links using network management applications.

Pricing for Solve:Attach 1.1 for SNMP starts at $11,000.

▶ *Sterling Software*
(703) 264-8000

CNet Technology, Inc. has introduced PowerSwitch SH-40, a switching hub.

According to the Santa Clara, Calif., company, PowerSwitch SH-40 is a four-port switching hub that allocates 10M bit/sec. bandwidth to each port. Additionally, two of the ports provide switch selectable, full-duplex 20M bit/sec. Ethernet.

PowerSwitch SH-40 features on-the-fly switching technology, filtering and forwarding at wire speed and minimal latency.

PowerSwitch SH-40 costs $899.

▶ *CNet Technology*
(408) 954-8000

Product shorts

Miramar Systems, Inc. has introduced Personal MacLAN, cross-platform peer-to-peer software that lets PCs and Macintoshes share files bidirectionally. It includes Miramar's 32-bit Virtual Device Driver. Cost: $199. Miramar Systems, Santa Barbara, Calif. (805) 966-2432.... **Artisoft, Inc.** has announced the LANtastic Power Suite, a six-product package combining the LANtastic network operating system with communications software. It also includes fax and modem communications software, modem sharing and pooling software and Internet access software. Cost: $199, for a one-user pack. Artisoft, Tucson, Ariz. (602) 670-7100.



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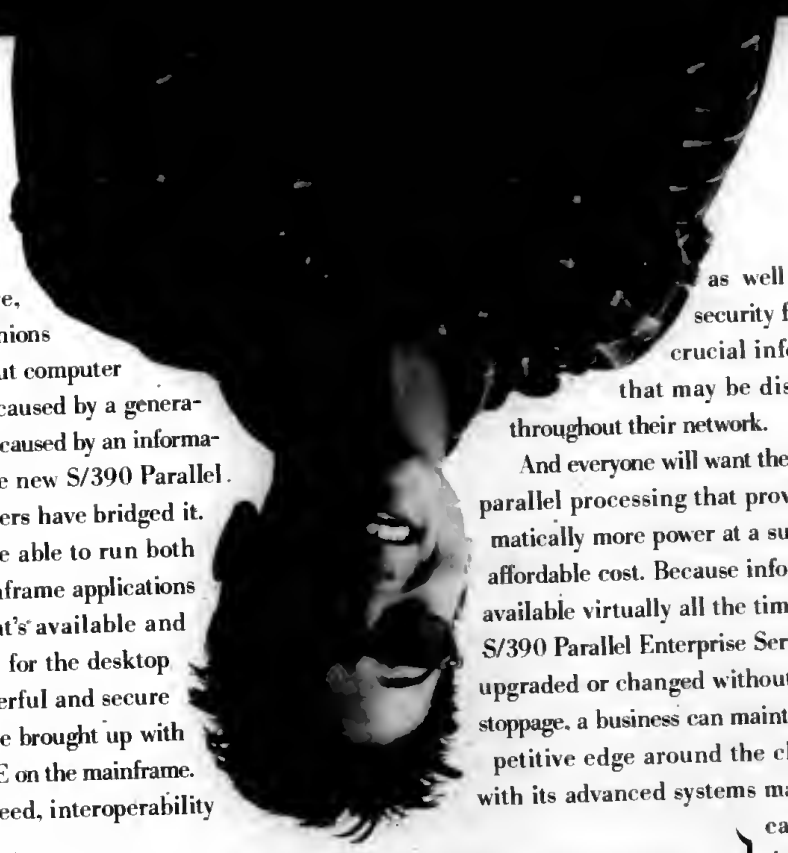
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Unisys takes parallel processing pledge

Company hopes latest server will cure its dependency on mainframes for revenue

By Neal Weinberg

Mike Jones, director of information technology planning and development at Bass Taverns PLC, has a thirst for information.

He wants to know how many pints of lager were sold in the Bass Tavern in Liverpool, England, on Tuesday night. He wants to know why a promotional event worked in one of the chain's 2,600 pubs but not in another. He wants to know what brand of stout a particular customer likes with his meat pie.

Jones already has vast amounts of point-of-sale data residing in his Unisys Corp. mainframe. The problem is, he can't do the kind of nimble, flexible queries that give him the type of information he wants.

So, Jones has decided to switch from mainframe to massively parallel processing (MPP) technology. He has selected the Open Parallel Unisys Server (OPUS), which Unisys launched in April.

Time for a turnaround

Bass Taverns, based in Smethwick, England, is an early adopter of what Unisys hopes will be a widespread trend among its mainframe users and new customers — a move to parallel processing for complex decision-support queries.

Recognizing that mainframe sales alone will not carry the day, Unisys has adopted a turnaround strategy of looking for revenue growth from information services and the OPUS machines.

The jury is still out on whether OPUS will be a hit, but analysts say Unisys may be catching a hot technology just as it begins to gain commercial acceptance.

Bob Desautels, president of the Harvard Research Group in Harvard, Mass., said parallel processing is a technology starting to make some noise in the commercial world. "It is very much an emerging market right now," he said.

Hubert Delany, research director at Gartner Group, Inc. in Stamford, Conn., said OPUS does not break any new ground technologically, but it is a well-designed product.

"If there's such a thing as a mainstream parallel processor, this is it," he added. And that meshes nicely with the Unisys customer base — users who "don't necessarily want to be on the leading edge."

George F. Thomas, senior vice president and director of data processing at New York Clearing House, a massive check-clearing operation, said he is not jumping on parallel processing technology anytime soon. "We don't like being experimental or being first on new hardware," he said.

Besides that, Thomas said he upgraded his Unisys mainframes last year. "That's going to hold us for a while," he said.

OPUS may be too early for Thomas, and it may be too late for Rick Sellers, president of Huntington Services Co., the information technology provider for Huntington National Bank in Columbus, Ohio. Sellers, a Unisys mainframe customer, has already begun off-loading some of his big iron applications to a symmetrical multiprocessing (SMP) box from AT&T Global Information Solutions.

Sellers said he has no plans to move to MPP, and he questions whether his software could be ported to the OPUS system.

Analysts said no one is expecting users to make quick buying decisions on a product such as OPUS. The purchasing cycle can stretch out over several months, even years.

But they said Unisys has done a good job of targeting key industries such as retail, airlines and banking. And it is marketing OPUS as a business system, complete with applications, rather than as a stand-alone piece of technology.

Solid support

Joe DeNatale, an analyst at the Clipper Group in Wellesley, Mass., added that Unisys has done well in getting independent software vendors to port to OPUS. So far, 25 companies have written applications for OPUS, and the system runs on databases from Oracle Corp. and Red Brick Systems.

"They have a good shot at being one of the primary vendors at this," Delany said. "It all depends on their record in the field" — in other words, how OPUS works out in customer sites.

"They have an ambitious strategy," added Brian Jeffery, managing director of International Technology Group in Mountain View, Calif. "I have trouble believing they're going to be No. 1. But they could be No. 2 or No. 3."

Unisys, Jeffrey added, does have an advantage over some other MPP vendors because it has experience selling to the highest levels of the corporate IS hierarchy. And the Blue Bell, Pa.-based company is making its sales pitches with a team that includes professional services people, emphasizing the point that OPUS is part of an information technology solution.

Jeffery added that Unisys is taking a very systematic approach to marketing the OPUS machines. The company is focusing on its core vertical markets, including banking, insurance, retail, airlines and so on. Moving even beyond those general categories, Unisys is targeting hard goods in the retail sphere, Jeffery said.

At Bass Taverns, Jones is benchmarking OPUS and shooting to have the system up and running by early next year.

Ultimately, Jones wants to consolidate all of his databases onto OPUS, so he can look at a certain pub and quickly gather a complete package of information, such as how it is doing financially, the track record of the manager, what types of products are selling, even when the building was last renovated. "The real trick," he said, "is turning analysis into projections."

Closer Look: Unisys

Building blocks
Open Parallel Unisys Server (OPUS)

- **Microprocessor:** 60-MHz Pentium from Intel
- **Microkernel:** Unix microkernel from Chorus Systems
- **Operating system:** Based on Novell's Unix System V Release 4
- **Database:** Vendor independent
- **Price:** $685,538 for eight-processor system with 40G bytes of storage

Gartner Group predicts that parallel processing sales will increase from $1 billion in 1995 to $5 billion by 1998.

The choice is yours

Parallel processors differ from SMPs in the way the machines attack problems. SMPs share memory among the processors, while MPPs divide a problem into discrete parts, then reassemble the data.

As a practical matter, SMPs do not have the capacity to scale as high as MPPs. Unisys, for example, has a 64-processor MPP machine running in its laboratories in Blue Bell, Pa.

Brian Jeffery, managing director at International Technology Group in Mountain View, Calif., said SMPs are probably a better choice for databases of less than 100G bytes. Between 100G and 500G bytes, it's a toss-up, and MPPs have a clear edge when the database exceeds 500G bytes.

Hubert Delany, research director at Gartner Group in Stamford, Conn., adds that even companies with relatively small databases could benefit from going with MPPs because the companies have the assurance that the system can scale to meet their needs down the road.

The use of MPPs outside of scientific applications has been hampered by the perception that they are more expensive, harder to program and less reliable than SMPs. — *Neal Weinberg*



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CISCO SYSTEMS

AS/400 clustering requires patience

By Craig Stedman

Clustering technology has finally come to the AS/400 in the form of a high-speed fiber-optic interconnect that IBM officially released late last month to share databases among multiple systems.

But it does not necessarily come easy. Early users of OptiConnect for OS/400 have had mixed experiences. Customers linking two AS/400s reported few problems, but several users with complex installations warned that while OptiConnect has kept their AS/400s from overloading, it required new hardware purchases, consulting contracts and the patience to deal with some bugs.

A primer

IBM's OptiConnect for OS/400 clustering technology

- Links multiple AS/400s for database sharing. Both tiered setups and peer-to-peer groups are supported.
- Targeted at large AS/400 shops with high-end models. Up to 32 systems can be hooked together.

"We probably did a good job of debugging [OptiConnect] for IBM," said Lee Nelson, director of technical services at American Medical Security, Inc. (AMS) in Milwaukee. "It got very touch and go. There were a lot of tight jaws around here in February and March."

OptiConnect is a combination of software and adapter cards that directly connects AS/400s at the database level via a 220M bit/sec. link. AMS, a medical insurer with roughly 2,500 users nationwide, turned to OptiConnect when its top-of-the-line AS/400s started bitting the performance wall.

But the firm ran into memory problems with OptiConnect that knocked out its AS/400s for as many as 18 hours at a time, Nelson said. "We had a couple days where we had to send the second shift home because we knew the systems weren't going to be available," he added.

More improvements

OptiConnect became more stable in April after AMS received some bug fixes, and the product has been able to shorten data access times, Nelson said. However, AMS is still waiting for IBM to fix bugs in the OS/400's database query software that locked up files after OptiConnect was installed. AMS had to buy an extra 80G bytes of disk storage that cost about $250,000 and off-load querying to its development system to avoid the locking problems, according to Nelson.

Steve Finnes, OptiConnect product manager at IBM's AS/400 Division in Rochester, Minn., acknowledged that bug issues slowed an early shipment program launched last fall. "I think people were kind of waiting on some of that stuff," he said. OptiConnect is installed at about a dozen AS/400 shops now.

However, the bugs cropped up more when customers did systems maintenance or switched job streams than during actual runtime operations, Finnes said. IBM is "crossing [its] fingers" that bug fixes are now in place, he said. "We beat the hell out of the system in the last quarter," he added.

OptiConnect costs about $36,000 for the software plus $10,000 per I/O card. But Werner Enterprises, Inc. had to buy a new high-end AS/400 Model 320 to negate the I/O overhead added by OptiConnect, said Jim Belter, director of technical support at the Omaha trucking company. It also ran into "a lot of consulting expenses," he said. "This was not a $40,000 acquisition."

Whoa, there!

Customers should allow six weeks to three months to implement OptiConnect, said Steve Finnes, IBM's product manager for the clustering technology. "I don't want people to think they can put this in on a weekend and be running the next week," he said. "It isn't rocket science, but it is a different environment" than AS/400 shops normally run.

Like AMS, Werner was hitting the AS/400's upper limits and had to adopt OptiConnect or switch platforms, Belter said.

OptiConnect reduced response times from five seconds to less than one, he added. But given the cost, "it wouldn't be a turkey shoot that we would do what we did" over again, he said.

Werner and AMS respectively linked four and five AS/400s via OptiConnect. Users that only tied two machines together, such as Oriental Trading Co. in Omaha and Countrywide Funding Corp. in Pasadena, Calif., said installing and using the technology has been much less problematic.

"We've experienced what I would consider no problems at all with OptiConnect in a production environment," said Bob Cargill, systems manager at Oriental Trading, a dealer of imported goods. However, only about 20% of the company's order-entry workers are currently tied into OptiConnect, he added.

CA, IBM create different paths to storage

By Steve Moore

Early users of distributed computing are finding that data residing on their far-flung machines is hard to find and easy to lose. Client/server-based integrated storage management promises to restore a measure of control.

But the two vendors leading the move to client/server storage management — IBM and Computer Associates International, Inc. — are going about it very differently. Both vendors support backup, archiving and hierarchical storage management for a broad variety of client and server platforms, but their architectures and market positions differ sharply.

The mainframe version of CA's Automated Storage Management (ASM) application is available separately from CA's Unicenter network and systems management software. But at the client/server level, ASM is bundled with Unicenter, and users must buy "the Swiss Army knife or nothing," noted Mike Peterson, president of Strategic Research Corp. in Santa Barbara, Calif.

In contrast, IBM's Adstar Distributed Storage Manager (ADSM) provides "a bunch of point solutions" that cannot match the centralized administration in Unicenter's ASM, Peterson said. For example, "right now, if you put three or four ADSM servers in a large environment, they don't talk to each other," he explained. However, these products are just the first glimpse of IBM's evolving strategy, he said.

Users of Unicenter and ADSM said they are happy to gain the central management capabilities. "We've had problems in the past when our file system ran out of space. It's nice to have [the ASM component in Unicenter] constantly monitoring our file system growth," said Donald Branch, a Unix systems administrator at Matsushita Electric Corp. in Secaucus, N.J.

A key difference between the IBM and CA approaches is that CA products do not manage desktop storage. Customers have not asked for that capability, said Yogesh Gupta, CA's senior vice president of systems management.

ADSM does support desktop storage management, but TCP/IP is required on each desktop. For that reason, Connecticut Mutual Life Insurance Co. in Hartford, Conn., plans to roll out TCP/IP and ADSM together, said Andy Raibeck, a senior data storage analyst.

With 2,000 PCs to manage, "another issue we're wrestling with right now is backing up duplicate data on each desktop," he added. The current version of ADSM does not recognize when the same file is backed up on multiple systems. That feature "would be a nice advantage," Raibeck said. IBM "is getting ready to deliver that with the next version" of ADSM, which is due next month.

For its part, CA acquired storage management products from Legent Corp. in Herndon, Va., earlier this year.

Sources said the newly merged companies have not yet determined whether or how their storage management applications will be integrated.

IBM and CA will face competitors with "single-platform products scaling up" to Unix, such as those from Cheyenne Software, Inc. in Roslyn Heights, N.Y., and Legato Systems, Inc. in Palo Alto, Calif., said Mark Friedman, a principal consultant at Demand Technology, Inc. in Naples, Fla.

Storage stack up

Client/server integrated storage management

Vendor/Product	Designed as	Storage repository	Backup
IBM Adstar Distributed Storage Manager	A storage management application	Disk-based	Incremental after initial full backup
Computer Associates Unicenter	A network and systems management application with ancillary storage management	Tape-based	Incremental but requires occasional full backup

Source: Strategic Research Corp., Santa Barbara, Calif.

Briefs

CSC wins contracts

Computer Sciences Corp. (CSC) in El Segundo, Calif., last month announced outsourcing contracts with two UK-based companies, Lucas Industries PLC and Guinness Brewing. Terms of the Lucas outsourcing contract, which is valued at $750 million in the next 10 years, call for CSC to ultimately acquire and manage all of Lucas' information systems assets, primarily in Europe and the U.S. CSC also bought Lucas Engineering & Systems and Lucas Management Systems.

Optamis software introduced

OPTX International, a Chico, Calif., provider of technology management integration services, has introduced Optamis, a software package designed to integrate systems management and asset management software throughout an enterprise computing environment. Optamis pricing starts at $50,000.

American Power Conversion Corp. (APC) has introduced Control-UPS/400, a power management device for IBM AS/400 systems.

According to the West Kingston, R.I., company, Control-UPS/400 combines APC's PowerChute/400 software and Control-UPS/400 hardware to manage and shut down an uninterruptible power supply (UPS) connected to AS/400 systems. Control-UPS/400 provides monitoring and shutdown functions, scheduled shutdown and testing and power event notification.

Control-UPS/400 can also be used to diagnose site and UPS ailments, including chronic over- and under-voltages and low battery conditions. It is installed on the AS/400 and connected to a Smart-UPS or Matrix-UPS through a serial communications cable.

Control-UPS/400 costs $399.

▶ *American Power Conversion*
(401) 789-5735

Information Builders, Inc. has announced SiteAnalyzer.

According to the New York company, SiteAnalyzer helps data warehouse architects compile statistics describing database usage patterns. The usage patterns help the architects determine which databases should be delivered to the data warehouse and identify changes in warehouse data requirements as their organization changes.

SiteAnalyzer also helps determine the cost involved in moving an application to the data warehouse. It provides detailed data by measuring all query activity and indicates high and low usage times for maintenance scheduling along with a log verifying usage, supporting charge-back facilities. SiteAnalyzer can monitor queries against more than 60 data file types.

Pricing for SiteAnalyzer starts at $24,500.

▶ *Information Builders*
(212) 736-4433

BGS Systems, Inc. has introduced Best/1 4.0 for Unix.

According to the Waltham, Mass., company, Best/1 4.0 for Unix combines real-time performance monitoring, a visual performance database and what-if modeling for performance and capacity management of multivendor Unix environments. It also collects and analyzes metrics from different Unix variants and provides users with uniform information and cross-platform management capabilities.

Best/1 4.0 for Unix is composed of Best/1-Monitor for problem detection and resolution; Best/1-Visualizer, a performance database; and Best/1-Predict, a what-if modeling tool. These components can be purchased individually or in any combination.

Best/1 4.0 supports Sun Microsystems, Inc.'s SunOS 4.0 and Solaris 2.x, IBM's AIX 3.2.5 and 4.1 and Hewlett-Packard Co.'s HP-UX 9.x.

Pricing for Best/1 4.0 depends on configuration and starts at less than $10,000.

▶ *BGS Systems*
(617) 891-0000

CFSoftware, Inc. has introduced PCMainframe 4.31 for IBM's TSO and CICS.

According to the Des Plaines, Ill., company, PCMainframe 4.31 lets users select, extract, format, upload and download data to and from mainframes. It lets users select files, records and fields and format data for mainframes or PCs on the fly. It also provides scripting and terminal activity automation.

PCMainframe 4.31 features four operation modes: interactive, host-defined, automated and unattended. It also includes libraries that function as data warehouses, letting users pool data from multiple PCs and create source files for data distribution.

Pricing for PCMainframe 4.31 starts at $12,500.

▶ *CFSoftware*
(708) 824-7180

Micro Design International, Inc. has released the SCSI Express dual-optical jukebox line for unattended access to mass storage.

According to the Winter Park, Fla., company, this line of optical jukeboxes uses a dual-picker mechanism that optimizes cartridge exchange and provides fast disk movement. A switching feature lets it use a single-ended or differential SCSI.

SCSI Express optical jukeboxes are available in three versions: a 41G-byte library with two multifunction drives and 32 cartridge slots, an 83G-byte library with four multifunction drives and 64 cartridge slots and a 99G-byte library with two multifunction drives and 76 cartridge slots.

Pricing for SCSI Express dual-optical jukeboxes starts at $21,995.

▶ *Micro Design International*
(407) 677-8333

BrainTree Technology, Inc. has announced SQL Secure 4, a suite of client/server relational database management system security tools.

According to the Norwell, Mass., company, SQL Secure 4 provides password and auditing management for RDBMS environments. It includes features for break-in scanning and detection, password synchronization, user-defined real-time auditing, row value auditing within selected tables and audit trail management.

SQL Secure 4 also features a password manager and an audit manager. The password manager lets clients change and maintain a single secure password across multiple platforms and databases. The audit manager uses a graphical interface for database security auditing and management.

SQL Secure 4 is available for Unix and OpenVMS systems. Pricing starts at $7,500.

▶ *BrainTree Technology*
(617) 982-0200

Baber Information Services, Inc. has announced Qsystem Monitor, a real-time performance monitor for IBM's AS/400.

According to the Irving, Texas, company, Qsystem Monitor lets systems department users evaluate system usage, tune system performance, determine trends in processor and disk usage and plan hardware requirements. It monitors 15 system components and three user-definable components.

Qsystem Monitor graphically displays elements on a Windows-based PC attached to the AS/400 and lets users view different components and performance levels. It also provides technical history, management summary and business activity reports.

Pricing for Qsystem Monitor depends on the model and starts at $1,000.

▶ *Baber Information Services*
(214) 257-1878



individual



Legent users jittery about vague CA merger plans

By Thomas Hoffman

Two weeks after Computer Associates International

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software at fire sale

products."

the Legent acquisi-

WORLD

Voracious CA gobbles up Legent

ffman and Steve Moore

to last week's an-

national, Inc

billion. They

Proposed CA-Legent union worries users

ENTERPRISE SYSTEMS Key issues: Products, service

BY PAULA MUSICH

Computer Associates International Inc.'s proposed acquisition Corp caused a flap of

tween the second- and third-leading systems-management vendors is unsettling for some IT managers.

"You don't serve the customer very well when you

CA's merger with Legent makes users wary

By Elinor Mills

(NEW YORK) COMPUTER Associates International Inc. (CA) last week offered few details on its product strategy in the

means of fleeing CA and its business practices," said Dale Gardner, an analyst at The Meta Group in

"We'll know more

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NETRON UPDATES COBOL TOOLS, 78
NEW PRODUCTS, 78

Application Development

CASE • LANGUAGES • TOOLS

Data warehousing: a group effort

Vendors work together to provide complete line

By Kim S. Nash

MCI Communications Corp. plans to try it.

American Express Co. is secretive about it.

The Home Depot is doing it and will probably redo it before the end of the year.

You cannot turn around in an information systems shop these days without bumping into someone talking about data warehousing.

Warehouses are databases designed specifically to hold large amounts of business information that end users can query, massage and analyze. Combined with increasingly more affordable parallel hardware that can rip through multiple gigabytes of data, warehouses are seen as mentor and more valuable cousins of yesterday's decision-support systems.

Yet few individual vendors offer stem-to-stern data warehousing products, according to Aaron Zornes, an analyst at Meta Group, Inc., a research firm in Burlingame, Calif.

Instead, companies that make databases, PC query tools, data cleansers and other warehouse-related products are banding together to fill gaps in one another's lines, he explained.

"Database companies are seeking out query tool partners, who are looking for middleware companies and so on," Zornes said. "It's like a 1970s dating scene."

Try before you buy

Users who want to dabble in data warehousing before buying can do so at a new laboratory recently announced by consulting firm SHL Systemhouse, Inc. The Data Warehouse Development Factory in Annapolis, Md., runs sample warehouses composed of hardware and software from various vendors, including Informix, Prism Solutions, Inc., Compaq Computer Corp. and others.

Coworkers

Such promiscuity makes users happy. Front-end tools, such as PC-based products for asking questions of databases, should work with as many databases as they can, according to a senior database administrator at Fidelity Investments Corp. in Boston.

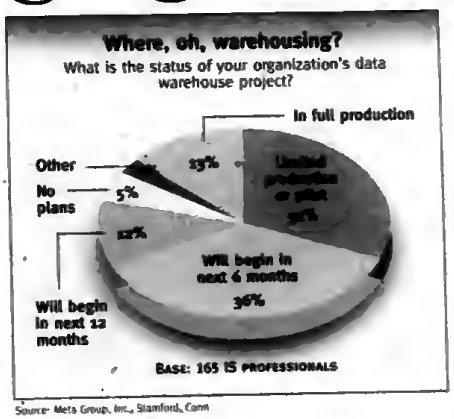
The financial firm runs databases from Sybase, Inc., Oracle Corp. and IBM's DB2, among others, so the company tries to avoid PC packages that cannot communicate with multiple databases, he added.

Oracle last month outlined partnerships with 30 firms as well as plans to deliver its own products. The plan includes a $100 million buyout of IRI Software, a unit of Information Resources, Inc. that offers sophisticated analysis tools [CW, June 19].

Sybase makes no bones about its mandate to buy products from other companies — or the firms themselves — to integrate with its core relational database.

To help boost its warehousing strategy, Sybase acquired Expressway Technologies Corp., a firm in Waltham, Mass., that offers a specialized data indexing tool designed to speed end-user access to databases.

Sybase plans to integrate Expressway's IQ Accelerator indexer with the forthcoming System 11 database late this year or early next.



Source: Meta Group, Inc., Stamford, Conn.

Build, not buy

Informix Software, Inc., on the other hand, has opted not to acquire and meld separate products.

"We want to build things into the core, not just slap in some add-ons," said Marianne Elkholy, director of data warehouse marketing at Informix in Menlo Park, Calif.

The vendor is considering adding warehouse-specific features such as special indexes to its OnLine relational database, Elkholy said. But she declined to give a time frame.

Meanwhile, Informix will rely on OnLine 8.0, an upgrade designed for massively parallel processing hardware planned for later this year.

The Home Depot's warehouse resides on a DB2 database. However, it is likely to be ported to Informix and as-yet-undetermined Unix boxes late this year, said Ron Griffin, chief information officer at The Home Depot, an Atlanta-based retailer.

DataEase's strengths balance a few quirks

By Jeffrey Gordon Angus

There are two key questions about database products for Windows: What kind of environment is it for end users to work in? And how good are the application creation tools for corporate developers?

DataEase International's DataEase 5 for Windows is the newest version of the long-running database system with the significant DOS-installed base. This version works well with existing DataEase DOS and OS/2 applications, but there is room for improvement.

Like competitive Windows database offerings such as Superbase, Inc.'s Superbase '95, Lotus Development Corp.'s Approach and Microsoft Corp.'s Access, DataEase 5 is marketed as a system for developers and non-developers alike. DataEase 5 also is similar to competitors in that each does things its own way, with some awesome features and surprising quirks.

On the good side, I believe DataEase's programming language, DQL, is by far the best of any Windows database system. Database languages should require fewer commands than general-purpose programming languages, with each line of code embodying a set of actions needed for database work.

Good database application developers need to know more about the program's ends and are generally far more productive with the focused set of commands. If you try to support too many things, you end up with Access, a big C-like language that is unnecessarily tedious for database developers' work. If you try to simplify the process so any end user can develop, you end up with a crippled product such as SQL.

DQL is an extensible language with the clarity and precision balance of Xbase. Out of respect for sophisticated developers, DataEase has included in this version a new Data Model Manager. This planning and analysis tool graphically illustrates the schema that shows all your tables, their fields and relationships between them.

Pluses and minuses

DataEase achieved mixed results in developing the end-user components. On one hand, the company has a clear interface for building the elements: The Object Palette has good icons on its buttons, and they work the way you think they should. And no Windows database has equaled DataEase's environment for creating action-launching buttons and developer-configurable menus.

However, DataEase 5 does not do a graceful job of handling formatting issues such as colors and fonts. It counts on style sheets instead. Style sheets — which assign default font and color information to objects — are a great idea, but the implementation is clunky enough to neutralize the potential time savings.

The company also decided to ignore

DataEase, *page 78*

PRODUCT TEST DRIVE

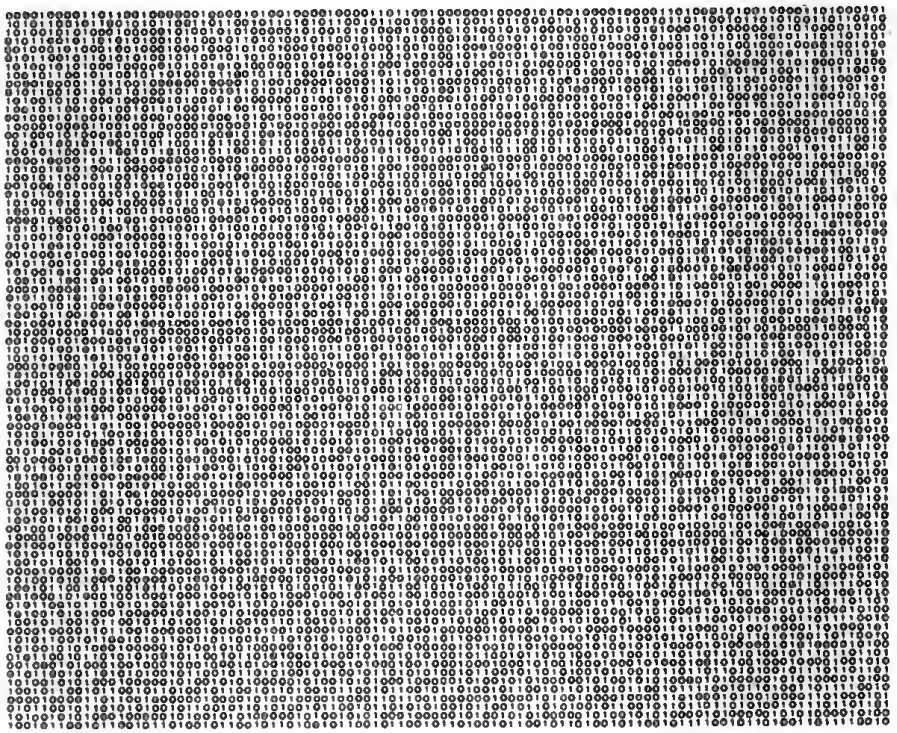


DataEase 5 for Windows
$495 ($149 upgrade)
DataEase International
Trumbull, Conn.
(800) 243-5123

DataEase supports both enterprisewide database connections and interapplication OLE links

■ The newest version of this database development system interoperates with DOS and OS/2 and provides an excellent database language, DQL. Some quirky manners don't offset its development strengths.

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Briefs

IS leaders honored

Applied Business Technology Corp. recently honored five project managers for outstanding leadership on information systems development projects. The managers, who were presented with awards at the annual Project Leadership Conference in Chicago, are Terry M. Nicholson at **Unisys Corp.** in Chicago, William M. Durbin of the city of Oakland, Calif., Manuela Longoria Walker at **AT&T Global Information Solutions** in Houston, Craig L. Lovell at **Rockwell Space Operations Co.** in Houston and Kim Parker at the **Tobyhanna Army Depot** in Tobyhanna, Pa.

Middleware tool debuts

Open Horizon, Inc. in Belmont, Calif., recently announced a product designed to act as universal middleware, connecting applications, databases and network products that adhere to Open Database Connectivity, Distributed Computing Environment (DCE) and other interoperability standards. The product set, called Connection, consists of client and server pieces. An introductory bundle of a database module and DCE directory security modules costs $295.

Software AG invests

In a move to broaden its data warehousing offerings, **Software AG** in Reston, Va., has taken a 15% equity position in **Carleton Corp.** and signed a worldwide distribution agreement, allowing it to directly resell Carleton's Passport product. The two companies are integrating Passport with Software AG's Sourcepoint data warehouse administration and maintenance tool, with an eye toward automating the data acquisition process.

Metals firm picks IS chief

Daniel L. Smith was named vice president and general manager of information technology at **Commonwealth Aluminum Corp.** in Louisville, Ky. Smith, 48, will be responsible for creating a fully integrated executive information system for the aluminum sheet maker. Smith, who was a private consultant, succeeds Roderick Macdonald, who will stay with the firm as vice president of human resources.

DataEase

CONTINUED FROM PAGE 75

the Windows-standard convention of select-multiple-objects/apply-formatting-to-all. The result: You can't change a selected group's formatting attributes without using the style sheet.

DataEase 5 for Windows doesn't have a dedicated data-definition window for describing tables, their fields and their fields' attributes. Instead, you build an entry form and for each field you lay down, you double-click on it and then describe the field and any relationships it has through a dialog box. This could be a serious productivity-enhancer for people who develop on the fly. As a person who draws it all out on paper first, I personally found it slow. I also found importing data from other applications limiting and intolerant. If you plan to import any non-DataEase data, you'll need to dedicate some time for data massaging.

Other new features include a snappy chart-building routine that creates graphs from your data, more flexible table formatting and migration routines to move older DataEase DOS and OS/2 applications to this Windows version.

For some shops, the fact that this product is the only usable programmable database system that interoperates in the three main Intel Corp. environments — DOS, Windows and OS/2 — will be a big selling point. If that interoperability is not a major concern, then this strong offering is best applied in sites with skilled database programmers who are comfortable working to a flexible data manipulation language.

Angus is project director at The Data Works Ltd. in Seattle.

[redacted]

Compuware Corp. has announced DataXpert 1.0, a tool that helps developers test client/server applications by automating the process of creating high-quality test data.

According to the Farmington Hills, Mich., company, DataXpert 1.0 lets developers obtain and modify relational data from Oracle Corp. and IBM DB2/2 databases located anywhere on a distributed network.

The product was designed to help developers identify and correct production data corrupted by application errors and give them access to multiple databases simultaneously.

DataXpert 1.0 includes features that allow users to copy and paste selected data from remote databases into test tables, tailor data to fit specific test conditions and automatically generate test data.

DataXpert 1.0 costs $250 per client copy and $500 per server copy.

▶ *Compuware*
(810) 737-7300

Fulcrum Technologies, Inc. has unveiled SearchBuilder for PowerBuilder, a development kit for Powersoft Corp.'s PowerBuilder Enterprise 4.0.

According to the Ottawa company, SearchBuilder for PowerBuilder lets PowerBuilder developers incorporate text-retrieval capabilities into their applications. It lets users see which terms have been indexed in the document database and gives them objects that support text-retrieval features.

SearchBuilder for PowerBuilder tool kits integrate with graphical development tools and let developers work in familiar environments to build applications.

Pricing for SearchBuilder for PowerBuilder development kits starts at $995 per copy.

▶ *Fulcrum Technologies*
(613) 238-1761

Scientific and Engineering Software, Inc. (SES) recently announced SES/workbench 3.0 for IBM RISC System/6000 and PowerPC 60t users.

According to the Austin, Texas, company, SES/workbench 3.0 gives systems developers a way to evaluate system design decisions throughout the development cycle and the means to verify functionality and performance.

The product supports graphical capture, animation and simulation of mission-critical systems. It also has tracing, break, statistics and library features for analyzing complex systems.

SES/workbench 3.0 is available under IBM's AIX for the RS/6000 running AIXwindows 1.2 and for the PowerPC 60t. It is also available for Sun Microsystems, Inc.'s Sun SPARC OS and Solaris as well as Hewlett-Packard Co.'s HP/9000 700 HP-UX workstations.

Pricing for SES/workbench 3.0 starts at $37,000.

▶ *Scientific and Engineering Software*
(512) 328-5544

National Instruments recently announced LabWindows/CVI 3.1, visual development software for Windows-based PCs and Sun Microsystems, Inc. SPARCstations.

According to the Austin, Texas, company, LabWindows/CVI 3.1 lets users develop data acquisition and instrument control applications using standard ANSI-C programming language.

LabWindows/CVI 3.1 features a CodeBuilder utility — a visual development tool for creating, editing and debugging event-driven programs.

Developers can use CodeBuilder to generate code segments on the fly as well as replace manual coding. The CodeBuilder utility also includes a timer control to simplify the programming of timed interval operations under Windows.

Pricing for LabWindows/CVI 3.1 starts at $995.

▶ *National Instruments*
(512) 794-0100

Object-oriented development

Netron updates Cobol tools

By Elizabeth Heichler

Netron, Inc. has overhauled its Cobol tools, adding a common desktop interface and template programs to speed application development.

Toronto-based Netron brings an object-oriented approach to the Cobol world by providing an engine that allows frames, or collections of Cobol routines, to be reused. It also offers a large set of Cobol class libraries that can be adapted and incorporated into new applications.

With Netron Fusion, a single desktop environment — Fusion Workplace — provides access to interface and report design tools, program construction tools and analysis tools. In addition, Fusion introduces QuickStarts template programs.

QuickStarts are preconfigured families of template programs that address the ways in which applications can be deployed, including batch and graphical user interface. Each includes program specifications, class libraries, screens and sample files.

QuickStarts are preconfigured families of template programs that address the ways in which applications can be deployed, including batch and graphical user interface.

Quick links

Links to non-Netron products such as Bachman Information Systems, Inc.'s analysis tools are also improved in the release with QuickFuse, according to Andy Staniewski, president and chief operating officer of Netron. QuickFuse is a set of utilities for importing and generating data from the non-Netron world.

Maura Gilchrist, senior systems specialist at Long Island Lighting Co. in Hicksville, N.Y., said the company plans to move to Netron Fusion. The new Workplace will allow her to consolidate all the Netron tools in one place, she said. Workplace also offers a better way to locate and access reusable code, she added.

While Long Island Lighting does not have plans to move to a purely object-oriented development environment, Gilchrist said using the Netron Cobol tools helps give developers an understanding of how object-oriented design concepts work.

Netron Fusion runs on IBM's OS/2 Warp for development, but applications can be deployed on platforms running IBM's OS/2, OS/400, MVS/TSO and AIX; Microsoft Corp.'s DOS, VMS and DOS/VSE; and Hewlett-Packard Co.'s HP-UX. Netron is also porting Netron Fusion to Microsoft's Windows NT and its forthcoming Windows 95, according to a spokesman. It costs $9,500 per development workstation.



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23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60 Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Manager
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Management
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑Yes ❑No
Networking Products ❑Yes ❑No

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30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
85 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin. Services
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60 Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Manager
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Management
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑Yes ❑No
Networking Products ❑Yes ❑No

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Management

The Dean of Do

STORY LINE: They say CIOs should never lead re-engineering efforts. Nevertheless, the University of Miami's CIO/dean, Lew Temares (below), is blowing through the school like a hurricane, bringing new technology and business practices to academia. Senior editor Joseph Maglitta shadowed Temares to see how this brash IS veteran is tackling the re-engineering of higher education.



"Can't forget my 'Big Gulp,'" says Lew Temares, grabbing a 32-oz. cup of Diet Coke. A moment later, giant soft drink in hand, he zips from his University of Miami office for whirlwind visits with his information systems staff and engineering students.

It's the perfect size beverage for a man who for 18 months has worked two full-time jobs. In early 1994, a special committee named Temares dean to lead a turnaround at the 70-year-old private university's troubled College of Engineering.

But Temares, 54, also remains vice president of the 180-person information resources department at UMiami's main campus in suburban Coral Gables. (He won't reveal his new salary but says it's far from double.)

His mission: reverse the spiraling costs and declining admissions that have choked higher education in the 1990s. That means rebuilding curricula, updating technology, cutting costs, boosting enrollment and generally re-energizing the program at a school better known for championship football than cracker-jack engineers. All this while eliminating a $4.5 million annual deficit by 1999.

"Throughout higher ed there are enormous pressures ... to reduce costs and make the institution more efficient," says Linda Fleit, president of Edutech International, an IS consulting firm in Bloomfield, Conn., that specializes in higher education. "Lew is at the forefront in terms of actually using things like re-engineering and information technology to actually deal with [pressures]."

After three semesters, it's too early to determine if the job-juggling has succeeded. But Temares has already shown that a savvy chief information officer can lead technological and organizational change in a non-IS area.

His orientation is startlingly businesslike for an academic administrator. "A dean is an operating manager of a major unit of a corporation," Temares says. "You pay attention to the bottom line."

The straight-talking Bronx native splits his time equally between the two jobs. It's a 75-hour-a-week balancing act, the success of which will shape not only the 700-student engineering program (down from 1,200 in the mid-1980s) but the entire university's network and computing future.

In the next few years, Temares must finish an ambitious $31 million telecommunications and network

The Dean of Do, *page 85*

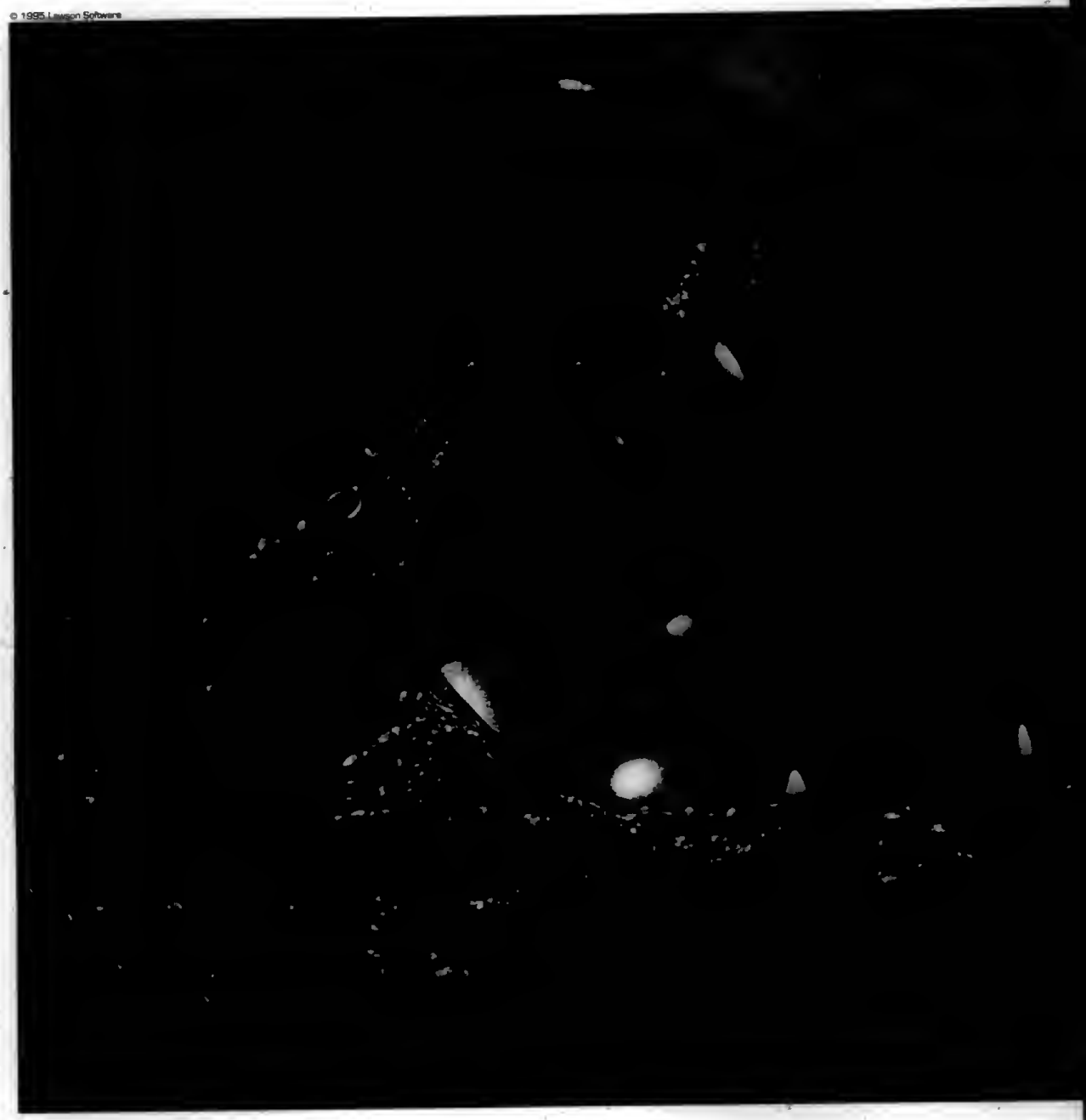
Lew's Views

"The trick is not downsizing, not rightsizing — which tend to lead to capsizing. It's allocation of focus."

"Dumping is giving people the crap and leaving. Empowering is giving them the work to succeed."

"Nobody wakes up in the morning and says, 'I'm going to do a lousy job.' Sometime in between, management did a lousy job, and now people are depressed and angry at something."

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Walk the talk

What's it like to re-engineer in higher ed? Come along as "Dr. Lew" makes his rounds.

Zip! Catch-up time with IS staff

Temares springs ont of his office at IS headquarters in the Ungar Building. He seems remarkably energetic for a man who averages four hours of sleep a night. He's routinely up working past 1 a.m. "I see Tom Snyder on a regular basis," he admits.

In less than 30 minutes, Temares vaults up and down three flights of stairs and checks in with staff at the help desk, computer center and telecommunications center. This "management hy walking around" is a hallmark of Temares' "people first" style.

"I couldn't do two jobs without heavy delegation and relying on my five IS directors," he says. Sharing the workload, Temares explains, lets him cover much more ground than usual. Spending time, however brief, with people ensures he's not out of touch. He laughs, teases, asks, tells, calls everyone by name.

He slows down to confer with Walt Bechtel, assistant director of end-user support, and authorizes the purchase of 100 new Pentiums. He stops at the computer training center. Established 18 months ago, the for-profit center has clients such as Electronic Data Systems Corp., Ryder Truck Rental, Inc. and the U.S. Air Force.

"We run it like a business," Temares says.

Meeting with 'the customers'

The lecture hall doors fly open. Soon the small auditorium fills with several dozen engineering students. The 45-minute meeting that follows is classic Temares. "Okay," he says, jacket off, facing students spooning university-provided ice cream from paper cups. "Ask me."

One inquires about a recent career development night. "We had 130 employers, from Texaco, Harris Corp., Rolls-Royce and other big corporations," Temares says proudly. "It was a tremendous success."

Zip!

A student complains that there's not enough access to the campus mainframe. The question bugs Temares. A major part of his cost-cutting strategy is to eliminate expensive computer time-sharing in engineering and move largely to PCs. Projected five-year savings: $1.7 million.

"You're a pain in the neck," he tells the young man jokingly, then continues: "We figured out it would cost $250,000 to set up an intricate compnter limit system on the mainframe. It's not worth the money and aggravation. What else?"

How's Lew doing?

- Deficit down $1.2 million
- New master's degree programs planned in medical information, environmental engineering and engineering management
- 100% placement for students seeking job assistance
- Research funding up 40%
- Six faculty posts cut



UMiami's Lew Temares is a rare moment at rest: Wearing dual hats as IS chief and turnaround leader at the College of Engineering (in background)

Real-world technology, skills

Temares arrives at the main engineering building. Along with the fresh paint, the attitude at McArthur Building is also new: attract top students with the latest information technology.

Soon after becoming dean, Temares wired all five engineering buildings with fiber-optic cable. Then he installed the college's first LANs (Novell, Inc.'s NetWare). Videoconferencing, connections to wide-area networks and better Internet links soon followed.

Zip!

Now, 66-MHz 486DX PCs replace dumb IBM 9000 terminals. Some $300,000 worth of digital logic analysis and modeling systems donated by IBM sit close by. An AutoCAD lab is under construction.

Sipping his "Big Gulp" soft drink, Temares peers into a full classroom. Along with tolerances and stress formulas, UMiami engineering students learn C++, Sybase, NetWare and more. Some also get hands-on experience administering information and telecommunications systems. Temares also got several computer and business departments to cut waste by elimiaating duplicated courses.

Besides teaching students how to act and dress like businesspeople, Temares has created a new internship program and a revamped co-op program with BellSouth Corp., Pratt & Whitney, Sybase, Inc. and others. He's also built a sophisticated database of industry, faculty and alumni contacts who can be tapped by job seekers and alumni. The bottom line, he says: "Jobs."

Changing the academic culture

In the hallway, Temares stops to chat with two engineering professors. Soon, a couple of students join in. Although the mood is warm, the CIO/dean has pushed hard to get faculty to think like service providers. Students and potential employers are referred to as "customers."

It's more than talk. Interviews with students found that only 20% of faculty were present during formal office hours. So Temares sent a blistering E-mail message. "It's 100% now," he says proudly. Other changes: mandatory Total Quality Management training and a ban on hard-copy memos. "Everything must be on-line," he explains.

Zip!

In recent months, he's hired a full-time marketing director, posted a recruiting page on the World Wide Web and made up re-engineering T-shirts and hats in hopes of boosting market share. To save travel costs and time, Temares courts high school guidance counselors via PictureTel Corp. desktop videoconferencing.

The Dean of Do

CONTINUED FROM PAGE 81

modernization plan aimed at preparing UMiami's four campuses for the 21st century.

Simultaneously, he must also lead efforts to reinvent bachelor's and master's degree programs and increase research funding. The vision: a strong regional and international program in biomedical, industrial, medical, civil, architectural and aerospace engineering.

University Provost Luis Glaser, Temares' academic boss, agrees that a CIO was "an unusual choice" for dean. But he notes: "Engineering is very much about technology. And Lew understands technology, and he understands people."

The 'doctor' is in

Temares already has one crossover success under his belt. An institutional researcher by training, he rebuilt a crumbling UMiami IS staff in the 1980s. He later shocked superiors by finishing a seven-year, $15.2 million technology revamp on time and $580,000 under budget.

"He inherited a hell of a mess when he came here," recalls David A. Lieberman, senior vice president of business and finance. Lieberman hired Temares in 1979 and still serves as his boss in IS. "If it takes soul and body to turn around something, he'll do it," Lieberman says.

University officials hope "Dr. Lew" can exhibit the same tireless zeal in executing the engineering school's new five-year strategic plan. So far, they haven't been disappointed: The College of Engineering boasts a 94.3% student retention rate — the highest at UMiami. Cost-cutting numbers also are on target (see "How's Lew doing?" on page 84).

Brash, fast-talking, energetic and frenetic, Temares often seems more like a sales executive or politician. A Ph.D. statistician/marketer who worked for IBM in the early 1960s, he also holds a master of science degree in business from Columbia University as well as an MBA.

Are the dual roles ever too stressful? Or disappointing? "I need a heart transplant on a regular basis," Temares jokes. He says his social life, reading and health have suffered. Still, he finds the challenge irresistible.

Temares' can-do style earns high marks from students, staff and administrators. Faculty response has been more mixed.

Many teachers have overcome their initial skepticism. But some still chafe at the new university and faculty-approved requirements Temares must enforce. One Temares innovation, mandatory use of office computers and electronic mail, is especially unpopular.

The information resources group has also felt the change. Last year the department managed to finish major development programs in human resources, career planning, student records and other areas. It also helped set up an imaging laboratory at the University of Miami School of Medicine.

While few can lead a major re-engineering effort while holding a CIO post, Temares may just succeed. His posture — an executive carrying out goals approved by faculty and administration — may help.

Other big challenges loom. Cost-cutting — $1.7 million in fiscal 1995 — must reach $3.8 million by 1999. That means a 20% slash in engineering faculty, 10% cuts in university staff and an 85% reduction in central computer usage. Moreover, the school must boost revenue to $1.45 million a year. To do so it is offering conferences, computer-aided design and manufacturing training and other special programs. Off-campus and weekend programs are also being developed.

And Temares and his staff must continue to drum up additional funds to wire the entire flagship campus with fiber. They're also testing Asynchronous Transfer Mode switches and trying to start a multimedia teaching center.

Temares says he plans to keep pressing ahead with his own upbeat mix of praise and pressure. "People like change — when it's positive," he says.

But his biggest ace in the hole may be school officials. They remain staunchly supportive — and realistically patient.

"Universities have time clocks that run in years," Glaser says. "We're not where we want to be, but we're on the path."

Maglitta is *Computerworld*'s senior editor, corporate strategies.

Another world's fastest chip

H-P claims its PA-8000 will outperform others

IBM accelerates revamp of OS/400; PowerPC version due later this year

As IBM ships the last of its promised OS/400 Release 3.1 components this week, it is paving the way for delivery of a completely redesigned, PowerPC-based OS/400 later

their respective server platforms.

The stakes are high. IBM claimed an installed base of 300,000 AS/400s at the end of 1994, with sales growing by 50,000 units per

IBM big iron revamps bode well for 95; Client/server OS, 64-bit architecture await AS/400

IBM has spent the past few years trying to answer questions about the ce in a client/server world. In will start to find out whether iant got it right.

ver-oriented rewrite of the g system is supposed to be ebruary, following a

eagerly awaiting the coming makeover.

IBM reiterates PowerPC commitm

IBM is expected to ship its long-awaited PowerPC systems in June, but with a beta version of OS/2 for Lee Reiswig, general manager of the Personal Products division, said at an analyst conference in Fla.

lifts curtain on 64-bit chip, keeps mum on Intel project

Determined not to lose mind share in the processor game, Hewlett-Packard Co. last week provided a glimpse of its 64-bit PA-RISC 8000 architecture, which is still a year from delivery.

At the same time, officials at HP and Intel Corp. all but denied a wire service news report that said the results of the two companies' collaborative microprocessor development would re in 1997 as In That report was based on Barrett, who

IN TUNE WIT

In showing that the 64-bit UltraSPARC an betting that 64-

"By the end Larry Inman, HP don't see the valu

HP set to launch PA-8000 chip systems not expected until 199

ard Co. plans to announce its next ecision Architecture microproces- on March 6.

expected to achieve a rating SCint92 and greater than 550 erformance numbers are the processor nears produc- with the product said.

k speed greater than 200

Sun Microsystems Inc's Sparc Technology Business and MIPS Technology Inc. have announced the architecture of their next processors a year before they will appear in products.

"It's sort of a liar's race," said Andrew editor of Inside the New Computer Industry. "The stakes keep going up."

The RISC chip makers are trying to prove have processors advanced enough to not only against each other but to also the gap in sors and editor of

IBM, Motorola To Announce 64-bit PowerPC

IBM, Motorola show off PowerPC 620 prototype; volume shipment expected in '95

IBM and Motorola are announcing the PowerPC 620 this week, the most advanced implementation of the PowerPC architecture to date.

As part of the announcement, the two companies introduced the first 620 prototype, with sample shipments to follow in the second quarter of 1995.

Volume production second half

64-bit PowerPC r, which IBM and will announce th, promises dra- rovements in multiprocessing over the 601, chips, sources

to come —twice 604's ca The other apart Powe

Sun announces untested 64-bit chip

Microsystems Inc.'s SparcTechnology d the id the

compared to Digital's Alpha AXP 21164, which has a SPECint92 rating of 330.

HP, Sun's biggest rival, is shipping a PA-7150 processor that has a SPECint rating of 135 and next month will introduce the PA-7200, which is expected to have a SPECint92 rating of about 150.

the performance gap but

1997 date set for delivery of HP/Intel P7

Intel Corp. acknowledged last week that the P7 will be the first chip to come out of the alliance finished with

per second (see "Pentium now, VLIW later," Jan. 30, page1).

The basic concept of the VLIW is to have the com-

PowerPC Much hype, little de

PC Week via First!: Hannover, Germany -- IBM, Apple Inc., and Motorola Inc. showed little restraint in hyping the here last week, but in private, officials from the eir standard isn't ready for prime time.

ange of PowerPC processors in the pipe that price/performance, lagging system and so ontinues to keep the PowerPC from breaking che and winning converts in the PC ing to take two to three years for us to really chall ll Hester, general manager of IBM's Systems and Division, in Austin, Texas. "I don't have illusions that this overnight disc

INTEL-HEWLETT-PACKARD ALLIANCE SEEN RALLYING A 64-BIT MICROPROCESSOR STANDARDS EFFORT

There are scant details of how Hewlett-Packard Co. plans to introduce technology developed under its al

traffic

massive 64KB Level cache, Intel products had 32KB or

IT'S NICE TO SEE IBM AND HP FIGHTING OVER WHO WILL BE NUMBER 2.

In fact, it's downright heartwarming. Digital, of course, beat both of them to 64-bit computing long ago. And while neither one has a 64-bit machine to sell you, we're now on our second generation of 64-bit Alpha-based workstations and servers. Machines that offer price/performance leadership at every level. For example, our new AlphaStation™ 250 system is half the price of the comparably performing HP workstation! While our new AlphaServer™ 8200 and 8400 systems are the first and only servers capable of running the newest 64-bit database products —letting your application directly address up to 14GB of data in main memory, and giving you performance gains of up to one hundred times over 32-bit enterprise systems. Alpha-based systems run thousands of applications—including the ones you need most. And, thanks to the enormous capacity and scalability of 64-bit architecture, they'll work with your present equipment, and grow almost limitlessly as your business grows. Sure, it's possible that HP or IBM really will have 64-bit machines, eventually. But even when they start offering real-world 64-bit products, it'll still be years before they'll have been as thoroughly tested and evolved as ours are right now. So why wait? Whatever your business, whatever your budget, you can do what thousands of companies all over the world have done—and what IBM and HP have been unable to do—have a 64-bit computer you can call your own. For more information, contact your Digital business partner. Or call 1-800-DIGITAL. Or reach us via our Internet address: moreinfo@digital.com.

Digital's lucky chip

...sales of systems based on the Alpha chip have taken off, jumping 66% in the past year, and now exceed VAX sales. The chip excels at handling thousands of concurrent users–which is why regional phone companies

Digital Ships Its 100,000th Alpha System

Digital Equipment Corp. reports it shipped its 100,000th 64-bit Alpha system. The milestone is significant, in our opinion, in that competitors IBM, Sun, and Hewlett-Packard have yet to ship their first 64-bit product.

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IS Managers' Bookshelf

New books, videos and CD-ROMs

The Collaborators' Manifesto

Teams can stifle innovation, says Michael Schrage. Collaboration is the key to productively sharing ideas.

NO MORE TEAMS!
By Michael Schrage
(New York: Currency Doubleday, 1995, $14.95, 229 pages)

This is an update to Schrage's 1989 *Shared Minds: The New Technologies of Collaboration*.

Schrage, a research associate at MIT's Sloan School of Management and a regular contributor to *Computerworld*, is still very focused on the dynamic of collaboration — what he calls "the process of shared creation." He asserts that many of the breakthroughs in science and the arts came through collaborative efforts and takes great pains to distinguish collaboration from teamwork and other forms of interaction — specifically, buy-in, delegation and participation. Collaboration, Schrage says, is fundamentally a relationship among equals sharing, connecting and correcting ideas.

I must admit I was attracted to this book by the title, because I share Schrage's dislike of the current teamwork paradigm much ballyhooed by management gurus. Certainly, a team-and-coach model of management is an improvement over the old command-and-control structure. However, an emphasis on the team can also stifle innovation or bog down into "groupthink" or "management by committee."



Schrage makes collaboration sound great, but how practical is it in the business environment? Unfortunately, too many of his examples are drawn from the research lab or other rarefied environments (airline cockpit, movie-making, emergency room). There is not much here about crack accounting teams, order clerks or shop-floor supervisors. Schrage acknowledges that collaboration really applies in situations where there are no known answers.

My advice is to skim most of the theorizing and endless quotations. Concentrate on Chapters 4 and 10 (core definitions and principles). Chapter 7 shows how display media can contribute to the rapid and productive exchange of ideas. Chapter 11 discusses future technologies for collaboration. Each is a "must read" for anyone involved in designing or selecting groupware.

It takes three to tango

James L. McKenney argues that it takes three talents to steer IS strategy — the CEO, the technical team and the technologist/entrepreneur

WAVES OF CHANGE: BUSINESS EVOLUTION THROUGH INFORMATION TECHNOLOGY
By James L. McKenney, et al.
(Cambridge, Mass.: Harvard Business School Press, 1995, $29.95, 230 pages)

I am fond of paraphrasing the French statesman Georges Clemenceau in stating that "technology is too important to be left to the technicians." This is very much the theme of McKenney's book.

McKenney's concept is that it takes three talents to develop an information systems strategy: the chief executive officer, a combination visionary/bookkeeper who has the latitude to fund projects but demands payback as well; the "maestro," a technologist/entrepreneur who can build superb technical staffs and persuade business peers to adopt the new systems and processes; and a technical team capable of unfreezing old thinking and developing procedures to take advantage of new technology.



The concept is illustrated by the extended case histories of two automation "pioneers" — Bank of America and American Airlines. Other case studies, including Frito-Lay, Inc. and American Hospital Supply Management Corp., are too cursory, although the final segment of Chapter 6 comparing these three experiences with the pioneers' is good.

Unfortunately, the case studies offer little that is new. Despite the fact that the author interviewed principals at both Bank of America and American Airlines, they never come across as real individuals. The narratives become a chronology of meetings and memos. Reading Chapter 5 is all that is necessary to get the gist of the argument.

McKenney is not entirely convincing that the "triumvirate of talent" itself delivers the goods on technology. Nonetheless, the value of this book is that it provides solid evidence once again of the critical role of the CEO. The tight relationship between the CEO and the maestro is critical; when it falters, IS is left to the mercy of a contentious band of business executives. The result is often trivial or incomplete systems initiatives. That's a lesson that has to be learned and learned again.



Book reviews by Leilani Allen, a director at Tenex (10x) Consulting in Burlington, Mass.

Don't miss Computerworld's Leadership Series

Our Leadership Series brings provocative, thought leadership to the pages of Computerworld every month. Must reading for CIOs, CFOs and CEOs, the Computerworld Leadership Series spotlights the perspectives of prominent thinkers in the IT world on a wide range of topics.

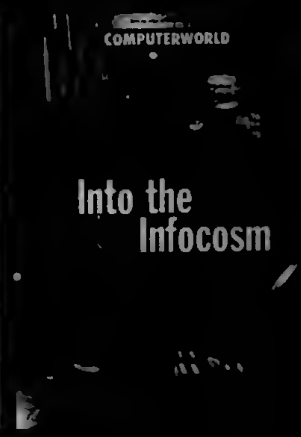


Coming in the July 17 issue of Computerworld

Into the Infocosm

By Glover T. Ferguson

Forget the Information Superhighway; what businesses need to know is where the highway leads. In a word, it leads to the Infocasm – a world where people will work, learn and play, uncanstrained by time, place and form. This warld is dawning fast, and Ferguson, the director of Andersen Consulting's Center for Strategic Technology Research (CSTR), explains how IT leaders shauld prepare. This feature is a must read for all senior information technology executives.



Don't miss these upcoming Leadership Series Features

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The Results



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IS Brand Preference Study on PC Software

Spreadsheet
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Best Technology	Microsoft Corp.
Best Price/Performence	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

Word Processing
Windows-based

Best Technology	Microsoft Corp.
Best Price/Performance	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

Software Suites
Windows-based

Best Technology	Microsoft Corp.
Best Price/Performence	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

Desktop Publishing
Windows-based

Best Technology	Adobe Systems, Inc.
Best Price/Performance	Adobe Systems, Inc.
Best Service Support	Adobe Systems, Inc.
Best Documentation	Adobe Systems, Inc.
Prefer to do Business With	Adobe Systems, Inc.

Draw & Illustration Graphics
Windows-based

Best Technology	Corel Systems
Best Price/Performence	Corel Systems
Best Service Support	Corel Systems
Best Documentation	Corel Systems
Prefer to do Business With	Corel Systems

Presentation Graphics
Windows-based

Best Technology	Microsoft Corp.
Best Price/Performence	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

Database Management Systems
Windows-based

Best Technology	Microsoft Corp.
Best Price/Performance	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

CASE
Windows-based

Best Technology	Micro Focus, Inc.
Best Price/Performance	Micro Focus, Inc.
Best Service Support	Micro Focus, Inc.
Best Documentation	Micro Focus, Inc.
Prefer to do Business With	Micro Focus, Inc.

Anti-virus
Windows-based

Best Technology	Symantec Corp.
Best Price/Performence	Symantec Corp.
Best Service Support	Symantec Corp.
Best Documentation	Symantec Corp.
Prefer to do Business With	Symantec Corp.

Security
Windows-based

Best Technology	Symantec Corp.
Best Price/Performance	Symantec Corp.
Best Service Support	Symantec Corp.
Best Documentation	Symantec Corp.
Prefer to do Business With	Symantec Corp.

Desktop Publishing
Mac/OS-based

Best Technology	Adobe Systems, Inc.
Best Price/Performance	Adobe Systems, Inc.
Best Service Support	Adobe Systems, Inc.
Best Documentation	Adobe Systems, Inc.
Prefer to do Business With	Adobe Systems, Inc.

Draw & Illustration Graphics
Mac/OS-based

Best Technology	Adobe Systems, Inc.
Best Price/Performance	Adobe Systems, Inc.
Best Service Support	Adobe Systems, Inc.
Best Documentation	Adobe Systems, Inc.
Prefer to do Business With	Adobe Systems, Inc.

Presentation Graphics
Mac/OS-based

Best Technology	Microsoft Corp.
Best Price/Performence	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

Database Management Systems
Mac/OS-based

Best Technology	Oracle Corp.
Best Price/Performence	Microsoft Corp.
Best Service Support	Microsoft Corp.
Best Documentation	Microsoft Corp.
Prefer to do Business With	Microsoft Corp.

Word Processing
Mac/OS-based

Best Technology	Microsoft Corp.
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Are In . . .

these top ranking companies Preference Studies on and PC Hardware



IS Brand Preference Study on PC Hardware

Desktop 486 PCs

Best Technology	Compaq Computer Corp.
Best Price/Performance	Geteway 2000
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	Compaq Computer Corp.

Pentium PCs

Best Technology	Compaq Computer Corp.
Best Price/Performence	Gateway 200
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	Compaq Computer Corp.

Workstations

Best Technology	IBM
Best Price/Performence	IBM
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	IBM

Monitors - 15" Intel Based

Best Technology	NEC
Best Price/Performance	NEC
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	IBM

Monitors - 17" Intel Based

Best Technology	NEC
Best Price/Performance	NEC
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	NEC

Monitors - 21" Intel Based

Best Technology	NEC
Best Price/Performance	NEC
Best Service Support	IBM
Best Documentation	NEC
Prefer to do Business With	NEC

Monochrome Notebooks

Best Technology	IBM
Best Price/Performence	Dell Computer Corp.
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	IBM

Color Notebooks

Best Technology	IBM
Best Price/Performence	Dell Computer Corp.
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	IBM

Subnotebooks

Best Technology	IBM
Best Price/Performence	Compaq Computer Corp.
Best Service Support	IBM
Best Documentation	IBM
Prefer to do Business With	IBM

Portable Modems

Best Technology	Hayes Microcomputer Products, Inc.
Best Price/Performence	U.S. Robotics
Best Service Support	Hayes Microcomputer Products, Inc.
Best Documentation	Hayes Microcomputer Products, Inc.
Prefer to do Business With	Hayes Microcomputer Products, Inc.

Portable Printers

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Total Trainer Program 1995. San Francisco, **Aug. 13-17** — Also offered **Aug. 27-31** in Orlando, Fla., and **Sept. 10-14** In Chicago Keynotes "The New Trainer: Interactive, Wired and Totally 'Unburnt-out' " by Elliott Masie, president of The Masie Center, and "Creating and Managing a Performance Technology Organization" by Jim Muller, manager of performance technology at Hewlett-Packard Co Contact Lakewood Conferences, Minneapolis, Minn (800) 707-7792

1995 International Customer Service Association Annual Conference. Orlando, Fla., **Sept. 9-13** — Theme: "In Search of New Customer Service Galaxies." Keynote speakers Tom Peters, founder of the Tom Peters Group, and Les Brown, author and television personality Contact: International Customer Service Association, Chicago, Ill. (800) 203-4272

Information Superhighway Summit. Santa Clara, Calif., **Sept. 11-14** — Sessions will cover the information superhighway's course in the coming year, changes in content and technology, telephone and cable regulation/deregulation and the effect of wireless offerings on telephone and cable companies Contact: IDG World Expo, Framingham, Mass. (508) 879-6700

USER GROUPS

Real World TeX: The 16th Annual Meeting of the TeX Users Group (TUG). St. Petersburg Beach, Fla., **July 24-28** — Focus: Preparation of documents with TeX — from author to publisher and all points in between as well as systems administrators and others involved in providing TeX support in a computer-based environment Contact: TUG, Santa Barbara, Calif. (805) 963-1338

TECHNOLOGIES

Network World Managing Enterprise Networks Conference. Boston, **Aug. 7-8** — Keynote speakers: L. David Passmore, president of Decisis, Inc., Bob Emerson, manager at Hewlett-Packard Co.; Brian Biles, group manager at SunSoft, Inc., and Leo J. Cole, manager-at IBM Fee: $895 Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-0526.

Object World. San Francisco, **Aug. 13-17** — Keynotes: "Object Technology: Road Map for the Future" by Gerald Held, senior vice president of Oracle Corp., and "Object Technology: The Journey So Far and What Lies Ahead" by Colin Crook, senior technology officer at Citicorp Fees: $1,195 before July 14, $1,295 after July 14 Contact: IDG World Expo, Framingham, Mass. (800) 225-4698

Northwest Association for Information and Imaging Management (AIIM) Conference. Seattle, **Aug. 17-18** — Topics include multimedia, integrated document management, networks and communications, text management, forms processing and workflow. Fees: $170 for AIIM members, $195 for nonmembers. Contact: Fred Westfall, AIIM Northwest Chapter, Seattle, Wash. (206) 924-7377.

INDUSTRIES

Market Driven Product Definition — Best Practices Implementation. San Francisco, **Aug. 21.** — Also offered **Sept. 30** in Phoenix and Scottsdale, Ariz., and **Oct. 26** in Atlanta. Topics will include resourcing product definition efforts, linking products to strategy, conducting successful customer visits, defining customer requirements and creating and maintaining customer focus throughout product development and self-assessment Fees: $895 per person; $795 per person for groups of three to five people, $745 per person for groups of six or more Contact: The Management Roundtable, Boston, Mass. (617) 232-8080.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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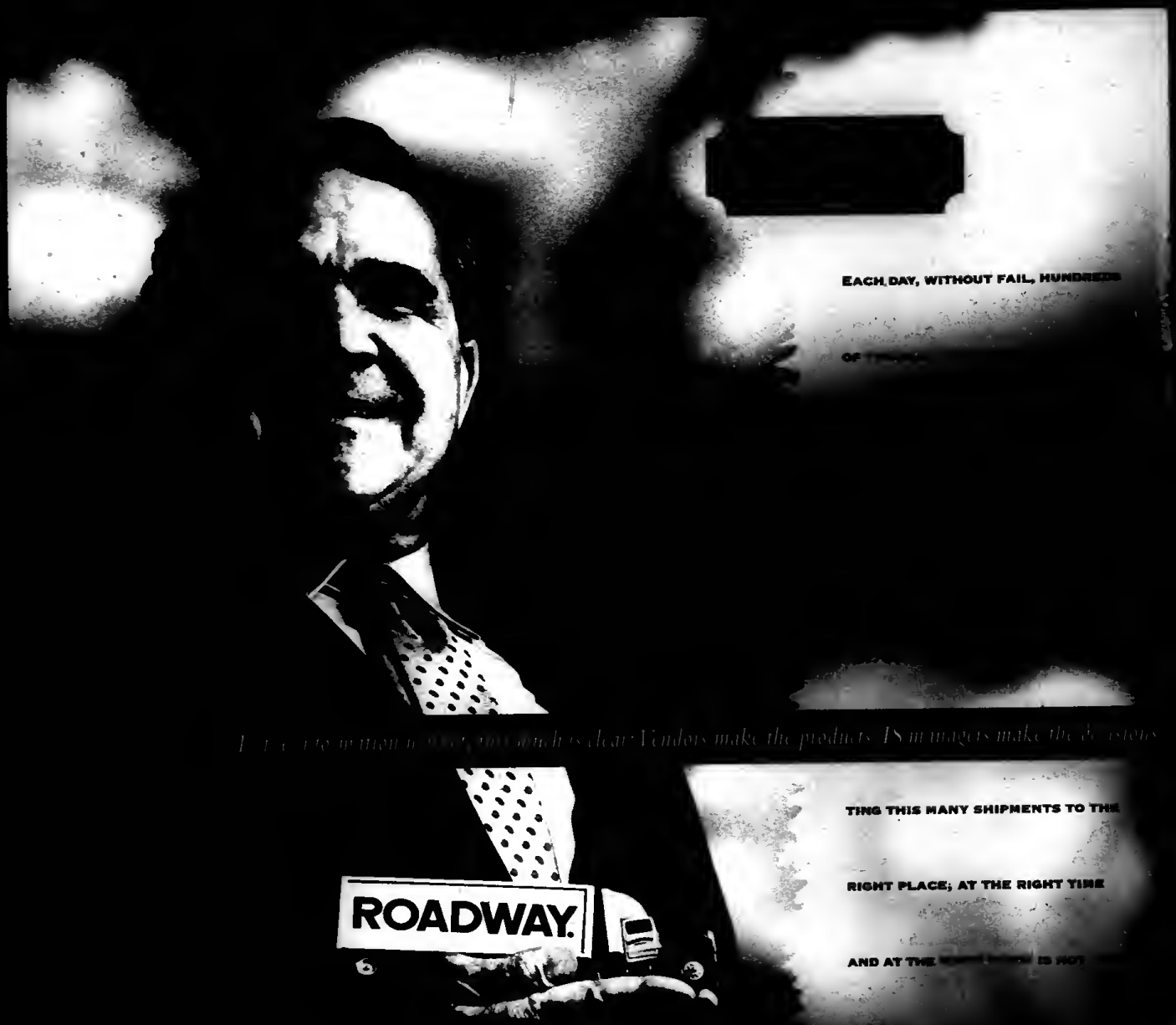
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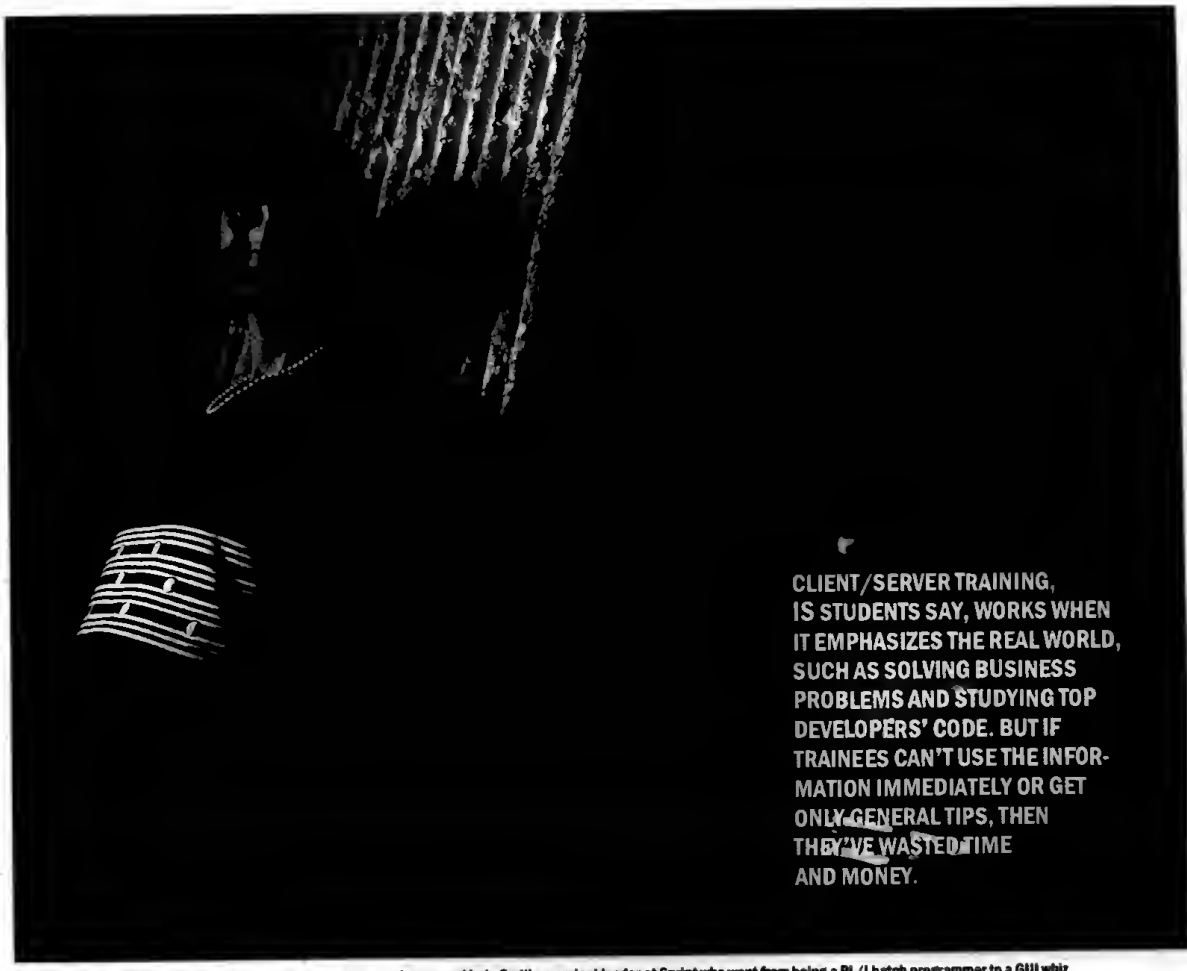
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In Depth



There is not enough actual code debugging in a client/server class, says Linda Smith, a project leader at Sprint who went from being a PL/I batch programmer to a GUI whiz

THE SCHOOL OF HARD KNOCKS

By Kathleen Melymuka

Sprint Corp. expected great things from the client/server training course. The content was excellent, and the instructor had the practical experience Sprint needed.

There was only one glitch: He couldn't teach.

"You can have a real good course, but if it's not delivered right, it's not going to work," says Larry Creel, methods consultant in Sprint's Department of Information Resource Management.

This is one more lesson in the school of hard knocks — also known as client/server training. And nearly everyone is enrolled. A recent study of 51 Fortune 1,000 companies by Forrester Research, Inc. in Cambridge, Mass., found that 96% of responding companies are retraining developers in client/server technologies.

School of hard knocks, *page 98*

"A LOT OF CLASSES HAVE BOGUS LITTLE APPS. IF THEY APPLIED TO A REALISTIC BUSINESS ENVIRONMENT WITH SERIOUS ISSUES TO CONTEND WITH, THAT WOULD BE MORE HELPFUL."
Deanna Calabrese, programmer/analyst, Grolier

Hard knocks

CONTINUED FROM PAGE 97

Client/server training is troublesome because it's so different. "Before, training was learning how to do something," says Ellen Julian, a senior analyst at market research firm International Data Corp. in Framingham, Mass. "With client/server, there are not only skills issues but approach issues and selling issues."

Despite the difficulty, companies have no choice but to forge ahead. Forrester found that 86% of respondents believe their development plans are, or soon will be, limited by the skills of their staffs.

What follows are the stories of IS people who are braving the world of client/server training.

COMPANY SNAPSHOT
Sprint
Overland, Kan.

Communications company Sprint has 3,000 to 4,000 software developers nationwide; about 25% of them have received some client/server training. Sprint estimates it has initiated between 25 and 40 client/server projects, most of which are extensions of Sprint's mainframe technology with frequent communication between PC clients and mainframe servers.

COST ANALYSIS
Training manager Mick Hartzell would not discuss Sprint's actual training costs, but he advises companies to "take your estimate and multiply it by five."

IS STAFF VIEW
Linda Smith
Project leader
Sprint Development Group

Linda Smith is not afraid of the unknown. She can't be, given that she turned in her PL/I batch programming, assembler, Natural and Cobol skills to become practiced in C and a whiz at graphical user interfaces.

One of Sprint's first IS staffers to take part in the company's client/server training, Smith today is elbow-deep in an account maintenance system for Sprint's customer service representatives. The system lets PCs access mainframe legacy data.

For Smith, client/server training is most effective when she has been exposed to the issues and terminology in advance.

Smith gets exposure through publications, seminars and lunchtime sessions with colleagues. She finds that training with colleagues is best because questions and answers are geared toward the specifics of your job.

Smith says using mentors saves time and prevents costly mistakes. "They've already been through it and know all the pitfalls of everything from project management to implementation," she says.

For example, Smith's group had trouble implementing new business rules into a system quickly and easily. Business rules may include mandates such as the fact that certain fields in a database must be filled in alphabetically or that a Social Security number field must be nine digits. A mentor developed a rule manager that made additions, deletions and changes quick and easy.

Just-in-time training is also crucial, she says. "You can't have training too far ahead of when you're going to use it," Smith says.

Smith also says she wishes more training time could be spent on problem solving and debugging and "on integrating everything you're learning."

MANAGER COMMENT
Mick Hartzell
Education consultant
Sprint

The key to training is flexibility, says Mick Hartzell, education consultant at the University of Excellence, Sprint's internal human resources division.

"We have to be very flexible because we may have a development group in Florida using Lotus Notes and another team may be doing Visual Basic in Sacramento," he says. While both groups would get taught the same methodology, training in the products may differ.

Hartzell might train Notes users through self-study but offer a classroom format to users of Microsoft Corp.'s Visual Basic.

What works

The good news in client/server training is that enough companies have tried it to get a sense of which approaches are most successful. Developers who have been through client/server training offer a remarkably consistent view of what works, including the following:

- **Previous high-level exposure to concepts**
- **Just-in-time scheduling**
- **In-house classes**
- **Heavy emphasis on real-world examples and situations**
- **Lots of hands-on exercises in class**
- **Emphasis on problem solving and debugging**
- **Detailed handouts that will work standing alone**
- **Mentoring**
- **Reviewing the code or applications of experienced developers**
- **Supplementary resources such as electronic bulletin boards, fax-back services, help lines, publications, informal groups**
- **Emphasis on the big picture: integrating everything you learn.**

COMPANY SNAPSHOT
Grolier, Inc.
Danbury, Conn.

Grolier is a publishing and direct marketing company with 25 software developers. Client/server technology supplements its mainframe systems by automating activities that are difficult to address on the mainframe. Grolier's small IS shop took a tightly focused approach to training, standardizing on Powersoft Corp.'s PowerBuilder, Sybase, Inc. databases and Unix.

So far, seven people have been retrained. The group completed a decision-support system for the direct sales force that analyzes customer response to direct marketing campaigns and financial applicatinns in which users on client PCs can npdate information stored on the mainframe server.

COST ANALYSIS
Eighteen months into the project, MIS project manager Ken Sciuto estimates that out-of-pocket training costs per developer are about $7,000. But there nre substantial hidden costs related to the six- to 12-month learning curve, he says. "We thought we'd be productive more quickly than we were," Sciuto says.

IS STAFF VIEW
Deanna Calabrese
Programmer/analyst
Grolier

Deanna Calabrese was doing mostly batch Cobol and IBM DB2 work when she was tapped for client/server training. She wanted to learn client/server so badly that she worked nights and weekends on "a killer mainframe project," to which she was already committed, to make time for training.

"It was well worth it because I really enjoy what I'm doing now," Calabrese says. She is designing front ends for client/server applications. Her skills now fall in the PowerBuilder and Sybase camps.

Calabrese says in-house classes have been most effective because colleagues train together and can stay late for hands-on activities and lab work.

She says she also found consul-

"NOTHING BEATS SIGNIFICANT TIME AT A COMPUTER PRACTICING WHAT YOU'RE BEING TAUGHT."
Jason Graf,
systems analyst, KFC

tants/mentors to be helpful. "They have had business experience, and we learned some tricks of the trade from them, such as how to create code that's more efficient yet smaller in size," she says.

The three Rs for Calabrese are relevance, realism and resources.

"You're not going to get training unless there's a business need for it," she says. Skills must be relevant. She has taken all the PowerBuilder courses available. "The skills I've acquired, I've used. That's crucial," Calabrese says.

That's why classes should be rooted in reality, even the sample applications used for practice. "A lot of classes have bogus little apps," she says. "If they applied to a realistic business environment with serious issues to contend with, that would be more helpful."

General training isn't immediately useful, Calabrese adds. Resources such as Sybase's electronic bulletin board service, a fax-back service with PowerBuilder tips, a CompuServe PowerBuilder training forum and on-site consultants help trainees customize learning.

"You learn by your mistakes, and the more practice you get, the better your expertise," she says.

Calabrese currently heads an informal mentor program to get the next group of trainees started.

MANAGER COMMENT
Ken Sciuto
MIS project manager
Grolier

The first seven mainframe programmers to undergo training at Grolier were chosen as much for their mind-set as for their talent. "This is an environment where rules can be broken, so we couldn't take stringent mainframe developers," Sciuto says.

The same concepts that have governed mainframe training are used in client/server: just-in-time training, knowledge transfer and team testing.

The effectiveness of just-in-time training was underscored by the one instance in which it *wasn't* used. Deadline pressures on other projects were such that the seven trainees who had completed basic PowerBuilder training delayed taking an advanced PowerBuilder class for more than a year.

During that year, programmers wasted time learning skills by trial and error that they should have learned in the course. When they finally took the class, they found much of the material redundant because they had already taught themselves.

What's the problem?	86% of 51 Fortune 1,000 companies say their client/server development plans are or will be limited by staff skills.
What's the solution?	96% of survey respondents say they are retraining developers in client/server technologies.
What's the cost?	50% of a year's salary per trainee.

Source: Forrester Research, Inc., Cambridge, Mass.

Knowledge transfer meant augmenting staff with consultants who led projects and mentored staff.

In team testing, each week a different person took all the code that had been written and conducted integration testing on it. "They reviewed their own code and other people's code, including the consultants', so they saw all kinds of enhancements and learned where it would work better if they did it a certain way," Sciuto says.

COMPANY SNAPSHOT
KFC Corp.
Louisville, Ky.

KFC, the world's largest chicken restaurant chain, has about 25 software developers. While maintaining its mainframe systems, KFC is developing client/server applications, primarily using PowerBuilder and often with the mainframe as the server.

Nine programmers so far have undergone in-house, third-party training in PowerBuilder. They have developed a decision-support system that consolidates key information from all the restaurants daily and redistributes it to field managers. They have also designed several human resources programs that track employee performance.

COST ANALYSIS

It cost $7,000 to train nine people because minimal formal training was needed. But there are hidden costs, says Tim Vogel, system development manager at KFC. "Projects where individuals are going through a lot of training frequently miss deadlines," he explains.

IS STAFF VIEW
Jason Graf
Systems analyst
KFC

"The most effective thing was the hands-on training in class," says systems analyst Jason Graf. "Nothing beats significant time at a computer practicing what you're being taught."

Graf says he especially appreciated his instructors' real-world examples. Later, while working on an existing application, Graf could see what approach the project team took and incorporate their expertise into his application.

To get the most from training, it helps to have some broad knowledge of the subject before you begin, he says.

Graf had some previous C and SQL experience, though he had mainly worked in Cobol and DB2.

He is currently straddling the second and third stages of KFC client/server training. As a junior programmer, he's supporting existing client/server projects, but he also has recently developed a small application that helps users keep track of n reserve account for closed restaurants.

MANAGER COMMENT
Tim Vogel
Systems development manager
KFC

"We are very much a project-driven organization," Vogel says. Therefore, just-in-time training is paramount. "In fact, when we've done training without a project, the trainees didn't use it, and we had to retrain them," he says.

Training generally is a three-step process. First comes an in-house PowerBuilder class taught by PowerCerv, a Powersoft training partner from which KFC demanded and received a real-world business orientation. "The [off-the-cuff] conversations and the way an instructor got a point across placed things in the context of real life," Vogel says.

After taking the course, trainees enhance or help support a project or head a project team of their own. "Usually, the person who was the primary developer on the application acts as coach," Vogel says. "In addition, we frequently use formal mentors [from training firms] for new developers or new projects."

This approach enables trainees to contribute to projects wherever they may be along the six-month learning curve. ■

Melymuka is a freelance writer in Duxbury, Mass.

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SUMMER Better Than Others

These information technology experts were testing career options during college summer vacations instead of hitting the beaches. BY ALAN R. EARLS

Current wisdom says getting summer employment in your chosen field can be the key to getting a good job. Information systems veterans, however, say there is no magic formula, and sometimes unlikely jobs offer unexpected lessons.

Recently asked to recall their long-ago summer sojourns, several IS pros produced a range of tales. Their stories differ considerably, but each agrees the experience was invaluable.



Carol O'Meara, *MIS director, Universal Studios, Los Angeles*

A part-time job as a medical illustrator at a veterinary school may seem an inauspicious place to begin an IS career, but to hear Carol O'Meara tell it, the story makes sense — "warts and all." In college, O'Meara was studying to be a medical illustrator, and she was fascinated by anatomy and excited to witness surgeries. But she began to feel the limits of her art. "I really wanted to find a way to do computer graphics in my field and to animate," she says.

After graduating in 1980, she went to the University of Chicago to pursue a joint master's degree in computers and illustration. There, she took additional programming courses, which paid off 10 years ago with an entry-level programming position at Universal Studios.

Joseph Smialowski, *CIO, Sears Merchandise Group, Chicago*

Joseph Smialowski got a taste for the business world the summer he taught archery at a camp for boys. It was his first opportunity to manage people and "run a small business," he says. At the time, he was working toward a philosophy degree from Merrimack College in Andover, Mass., though after graduation he discovered "there wasn't much demand for philosophy majors in 1971." Computer programming, clearly a growing field, beckoned.

A course at the Computer Processing Institute in Hartford, Conn., helped him land a programming job at an insurance firm, and a few years later he began a 10-year stint at Xerox Corp. He followed that up with several years at Price Waterhouse, where he became a partner. "Looking back at my early work and educational experiences, I think training in philosophy encourages taking a look at the big picture," he says.

Bernard "Bud" Mathaisel, *director of multimedia, Ernst & Young, Boston*

While on his way to an engineering degree from MIT in the early 1960s, Bud Mathaisel took a job working in the punch-card processing facility at John Hancock Mutual Life Insurance Co. "We had to design the process and the job, wire up the boards for the tabulators and sorters and think about how we could do continuous process improvement," he recalls. "Nowadays, with the renewed focus on process engineering, we are asking systems people to return to that hands-on feel we used to have."



Larry R. DeJarnett, *vice president and director, Information Technology Center of Excellence, A. T. Kearney, Inc., Chicago*

While many young Americans were waxing their surfboards or forsaking crew cuts for beards and bongos in 1961, Larry DeJarnett was making all the right moves at Southern Illinois University at Carbondale. An opportunity that changed his life arrived the summer before his senior year.

The university's director of institutional research took him aside to offer some advice. "I can still remember exactly how he looked at me from across his desk," DeJarnett says. Instead of extolling the virtues of plastics, the director said, "Larry, the wave of the future is computers."

The university was about to buy its first computer, and DeJarnett got a job helping to install and operate the IBM 1401.

After graduation, DeJarnett continued to work on the computer, wrote his master's thesis on the potential for library automation and went on to help Ford Motor Co. create a forerunner to electronic data interchange. "For me, that first job turned out to be game, set and match. It defined my career direction. I didn't even have to start as a programmer," he says.

Michael Simmons, *principal, MS Associates, Winchester, Mass.*

It wasn't love at first sight, but Michael Simmons says he knew he had a passion for technology. "I had always had mechanical aptitude. During college, I used to go to a local auction where I would buy cars, repair and sell them," he says.

However, the road to technology was less than direct. With a biology degree under his belt, Simmons began teaching in 1964 in Indianapolis, where he had a critical computer encounter. His school got punch-card readers, and Simmons was the first to roll up his sleeves and learn the technology.

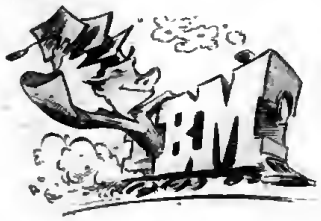
Shortly thereafter, Simmons left academia to work as a systems engineer at IBM. In the next dozen years, he rose within the ranks to become administrative assistant to the director of education. In addition to his auto experience, Simmons credits his people skills honed while at college. "I was a bartender on the weekends and a waiter during the week."

Ron Griffin, *vice president of IS, CIO, The Home Depot, Atlanta*

Information technology wasn't part of Ron Griffin's original career plan. Majoring in biology with a minor in math and physics, Griffin thought he was going to medical school from the University of Alabama — that is, until he took a summer job in that field. "My last year in college, I worked at the local hospital and decided right there that medical school wasn't for me," he says.



Griffin worked for an immunodiagnostics company for a few years after his 1975 graduation and then landed a position at Delta Air Lines that led to a job as a programmer trainee.



Stephen D. Sprinkle, *managing director, Deloitte & Touche National, Atlanta*

Working for a physics professor who also ran a consulting business turned out to be Stephen Sprinkle's most significant summer experience. "I was assigned to develop software systems that would support an educational program used in elementary schools," he says. Later, he helped develop a program to oversee and manage vehicle service and maintenance.

At the time, Sprinkle was attending the State University of New York at Stony Brook, where he received degrees simultaneously in computer science, economics and applied mathematics. After his 1974 graduation, he spurned several more lucrative job offers to take a position at IBM. His goal was to learn all about "the dominant architecture" in the computer world at the time. There, he helped develop software for high-capacity LAN deployments and other new technologies. ■

Earls is a freelance writer in Franklin, Mass.

Illustrations by Dave Vaughn Studios

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NETWORK SOFTWARE ANALYST

Your expertise in working with Local Area Networks should enable you to provide definition, selection and administrative support in the areas of Novell, Notes, WIN NT and Pathworks. You will be directly involved in installing/upgradiog client workstation network software, debugging/problem solving network and end-user problems, and administrating network protocols/capacity planning.

Your BS/BA in Computer Science, Electrical Engineering or equivalent must be supplemented by 4+ years experience with Pathworks, Novell and TCP/IP. Knowledge of Network General Sniffer, Fluke Portable Monitor, Optivity for Windows or Spectrum is essential. Solid understanding of Ethernet and IEEE 202.3 specifications and Topologies is necessary. Job Code: VW-215-95

NETWORK SUPPORT SPECIALIST

Your outstanding technical skills will be utilized to provide PC support to end-users and assist in the definition and administration of Local Area Networks. In addition, you will support Pathworks, Windows, OS/2, TCP/IP and Novell as well as personal computer configuration and LAN connectivity.

A minimum of 4+ years experience with LANs, Pathworks, TCP/IP, Windows, DOS and Novell is required. Experience in the installation of PCs and the configuration of system hardware and software is a must. Excellent verbal and written communication skills are essential. Job Code: VW-217-95

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Programmer Analyst to analyze and develop software including SYNON, Cobol/400, CL and APPC CPIC for company's business applications to be utilized by internal customers at various facilities and maintain existing CL and RPG/400 functions; manage small projects and communicate SYNON, COBOL and CPIC programming tips and techniques to other team members, including assisting DBA in designing data model changes in SYNON; produce efficient, error-free programs which conform to user requirements and specifications; participate in JAD (joint application development) sessions with users to derive application requirements; create prototypes using SYNON and identify new functions and improvements in coordination with users and customer support including the design of screen input/output prototypes using SYNON/1; write test scripts and perform systems testing and help documentation writers to understand the features and functions of the system; develop dataflow diagrams using Knowledgeware's ADW; must have Master's degree in Computer Science or Computer Engineering with 1 year of experience as Programmer Analyst or 1 year of experience as Systems Analyst experience must have included developing software including the development of SYNON functions & the design of prototypes utilizing SYNON/1; maintaining programming on existing systems & functions including CL & RPG/400 & developing dataflow diagrams using Knowledgeware's IEW or ADW; coursework must have included advanced software development, the design of computer languages & communication systems; will accept applicant who gained the necessary experience as a Programmer Analyst or Systems Analyst under the title of Associate Software Engineer. 40 hrs., M-F, 8:00 a.m. to 5:00 p.m. $40,500 per year. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street, 3 South, Chicago, Illinois 60605, Attention: Brenda Kelly, Reference # V.IL.12737.K. NO CALLS. AN EMPLOYER PAID AD.

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Programmer-Analyst 40 hrs./wk. 8 am-5 pm. $50,000 /yr overtime as needed, compensated at $24.03/hr. Job requires Bachelor's degree in Computer Science or Management Information Systems and 18 mos. experience in Job Offered or as Programmer Analyst. Job also reqs. 1) Exp must include 18 mos. exp using ORACLE & C softwares & 2) Exp. must include 18 mos. exp programming in a UNIX environment. Any exp reqs. may be met concurrently during the same 18-mo. period. Job duties: Design worldwide database & centralized system for business practices of major automotive manufacturer. Analyze, develop, test & implement system. Develop screens using ORACLE & SQL*FORMS. Write batch programs using C, PRO*C & PL/SQL computer languages in a UNIX, Sequent environment. Develop reports. Qualified applicants should send resume & verification of reqs. to: 7310 Woodward Ave. #15, Detroit, MI 48202. Ref #120595. Employer Paid Ad.

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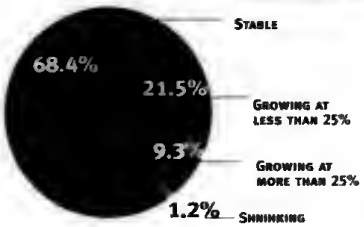
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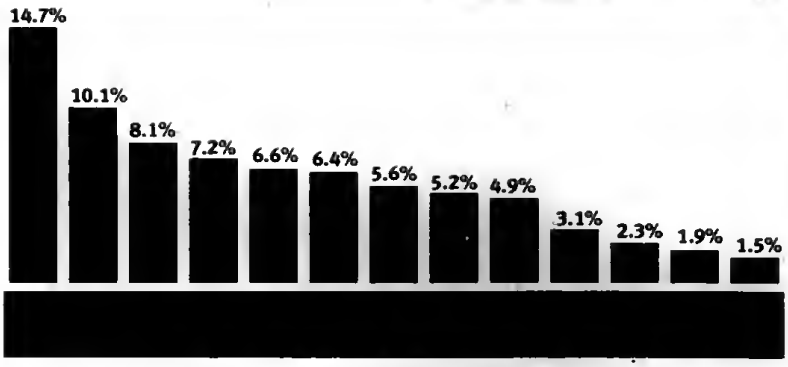


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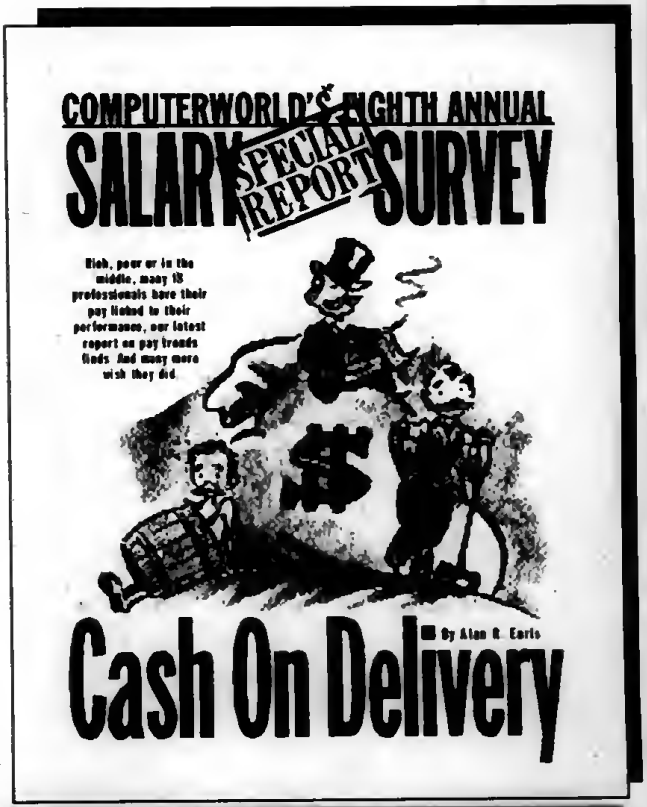


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Marketplace

INTERNET ACCESS

? Questions for your provider ?

By Leslie Goff

NO, you don't need to know a secret handshake. Picking an Internet access provider (IAP) is like most purchase decisions — application-driven.

IAPs include a range of entrepreneurs and large companies, "from two people in a loft in downtown New York to full-service, turnkey providers," says Stan Lapeak, a senior analyst in the advanced information management strategies service at Meta Group, Inc. in Stamford, Conn. Therefore, the choice of provider should be well planned.

"You must determine the business goal," Lapeak says. "Many companies go out on the 'net just because they can. But if you want to use the 'net for research, you'll need a different type of access than if you're going to support electronic commerce."

For example, what types of resources will the Internet application require? How much activity do you expect? Will you need high-end systems integration services or consulting? What security setup does your company need? What type of commercial Internet access do they provide?

Feeling them out

Armed with answers to each question, you should evaluate vendors for bandwidth capacity and overall service levels, cost, experience and reputation.

"If you're truly going to use the Internet for business, you must find a very fast, reliable, connected network," says Steve Schoffstall, director of sales and marketing at PSINet in Herndon, Va. "There are some big players with nationally connected nets, some second-tier IAPs connected to those networks and third-tier providers with dial-in access to a second-tier network."

The size of the connection is also important, says Don Proctor, network manager at Sybase, Inc. in Emeryville, Calif., adding that many companies slide by on slow dial-up access. He recommends starting with at least a 56K bit/sec dedicated line for high-volume applications.

"It's very easy to become an [IAP]," says Dick Costolo, a software architect at Andersen Consulting in Chicago. "In two weeks, you could become an IAP and have your service up on the 'net. Is that the kind of service you want to buy? You need to be sure your vendor has longevity. You don't want your E-mail address changing every four months."

Don't rule out alternative solutions to a single IAP. Andersen, for example, maintains and supports its dedicated T1 connection to the Internet because "you reach a certain threshold of business activity at which it becomes cheaper to do it in-house," says Marc Rettig, senior architect of Andersen's Eagle Project, the firm's internal network infrastructure.

Andersen's high volume of Internet activity, tight security requirements and custom programming needs — combined with its wealth of internal technical talent — were compelling reasons for providing its own connection.

"It all comes down to how much control you want to have on the 'net," Rettig says. "If you're installing [wide-area information] servers or search engines, then you need a highly flexible, reliable provider or you should do it yourself. If you want customers to be able to fill out forms on your Web page, that will take some custom programming. A lot of large [IAPs] will do that for you, but it may be harder to set it up vs. if you own the box and do it yourself."

Dividing it up

On the other hand, you may want to parcel out pieces. Sybase works with four IAPs: NetCom, PSINet, BBN Planet Corp. and UUNet Technologies, Inc.

"We use each for different purposes, but having four also ensures that we offer a certain level of diversity for our users," Proctor says. "PSINet and BBN Planet carry most of our traffic, but we also rely on UUNet for network news services and NetCom for dial-up service to support E-mail and Web access. One provider could handle all of those things, but we want to retain a certain flexibility."

An emerging option is to hand the decision off to a consultant such as Electronic Data Systems Corp. in Plano, Texas. "We don't see access provisioning as our core business, but more as part of a value chain in an integrated approach," says Larry Lozon, vice president for Internet and on-line services at EDS. "We'll serve as an integrator and will work with myriad access providers according to our clients' needs." ■

Goff is a freelance writer in New York.

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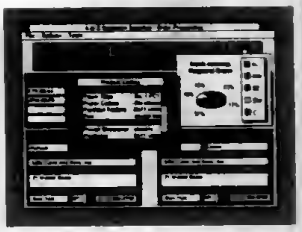
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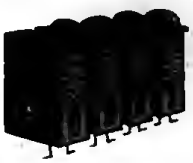
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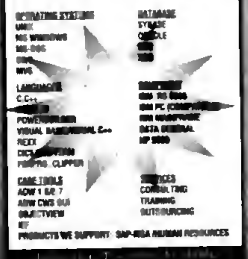
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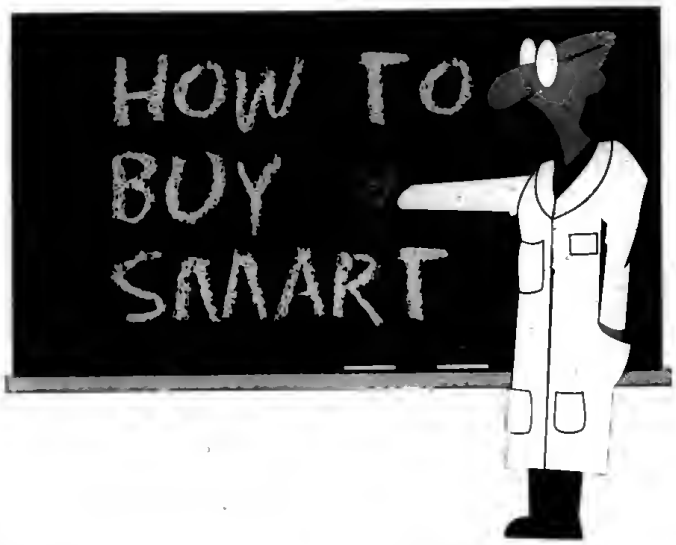
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Percent

Group I Software(N)	104.2
4th Dimension	36.6
Sequoia Systems Inc.	29.2
Magic Software Enterprises	23.6
LSI Logic Corp	18.8
Pedre Data Comm Networks	16.7
Ascend Communications	16.2
Computer Network Tech.	16.1
Encore Computer Corp.	-18.9
Netrix Corp.	-18.8
Struct Dynamics Research	-13.5
CE Software	-13.0
Harris Computer Systems Corp	-10.4
Creative Technologies Inc.	-9.9
Quarterdeck Corp	-9.5
Compcom Corp	-9.1

Dollar

Group I Software(N)	12.50
US Robotics	12.13
Xerox Corp	4.25
Ascend Communications	8.00
Xylan	7.75
Stratacom Inc.	7.00
LSI Logic Corp	8.75
Hyperion Software Corp.	5.75
Compcom Corp.	-2.25
Symantec Corp.	-2.00
Computer Associates Int'l	-2.00
Struct Dynamics Research	-1.75
Netrix Corp.	-1.38
Harris Computer Systems Corp	-1.38
McAfee Associates	-5.25
Quarterdeck Corp.	-1.13

Opening the floodgates

For private computer technology companies, Wall Street is looking pretty good right now. Hungry investors have been buying up technology shares, driving prices higher and higher for months. And the number of initial public offerings (IPO) in this area reflect that other companies want a piece of the action, too.

Forty-three firms took the plunge this month, according to Technologic Partners in New York. A good number were in the multimedia or on-line services arena, including **Number Nine Visual Technology Corp. (NINE), Diamond Multimedia Systems, Inc. (DIMD), Spyglass, Inc. (SPYG), UUNet Technologies, Inc. (UUNT) and VideoServer, Inc. (VSVR).**

One client/server software firm, **Seer Technologies, Inc. (SEER),** exemplified this IPO opportunity. "It was really simple. We needed the money," said Gene Bedell, president and chief executive officer of the Cary, N.C., firm. "We considered it [an IPO] last year and started the process, but it just got to the point that it was not the right time."

—Tim Ouellette

The debutantes

The following is a sample of the slew of information technology IPOs for the quarter ended June 30. The listing excludes companies with less than $50 million capitalization.

Company	IPO date	IPO price	July 6 price
Bell & Howell Holding	May 1	$15.50	$19.88
Creative Computers	April 4	$17.00	$27.00
Datalogix International	June 15	$17.00	$25.50
Diamond Multimedia Systems	April 12	$17.00	$19.50
Discreet Logic	June 30	$21.00	$31.50
Expert Software	April 11	$12.00	$18.50
Firefox Communications	May 4	$18.00	$26.25
HNC Software	June 20	$14.00	$22.75
Number Nine Visual Technology	May 25	$15.00	$22.25
Open Environment	April 13	$15.00	$31.13
Performance Systems International	May 5	$12.00	$16.75
Seer Technologies	June 30	$18.00	$18.63
Spyglass	June 26	$17.00	$29.00
StorMedia	May 4	$16.00	$39.00
UUNet Technologies	May 25	$14.00	$30.25
VideoServer	May 24	$17.00	$40.00

Source: Technologic Partners, New York

Exch	52-Week Range			July 7 $	Wk Net Change	Wk Pct Change
Communications Equipment						UP 4.6%
OTC	30 3/8	23.81	3COM Corp	70 3/8	3.00	4.5
NYS	47.25	38.00	AMERITECH Corp	46 1/8	1 1/8	2.9
NYS	93.88	67.25	AT&T	94 3/8	1.15	1.1
OTC	57.25	6.63	Ascend Communications	57.25	8.00	16.2
OTC	19.75	11.00	Banyan Systems Inc	15.63	1.00	7.5
OTC	65.13	38.63	Bay Networks Inc (H)	65 1/5	5.75	9.1
NYS	58.38	48.38	Bell Atlantic Corp	58 1/5	1.38	2.4
NYS	64.38	50.50	BellSouth Corp	63.63	0.13	0.2
NYS	70.00	10.00	Bell, Boehner & Newman	57.65	0.50	1.8
OTC	19.75	9.00	Brooktrout Technology	16.25	1.75	12.1
NYS	57.50	37.38	Cabletron Systems	57.50	0.38	0.2
OTC	52.25	10.00	Centigram Communications	16.25	0.00	0.0
OTC	25.00	20.00	Compcom Corp	22.38	-2.25	-9.1
OTC	56.94	18.75	Cisco Systems Inc.	54.94	4.06	8.0
OTC	15.75	6.13	Compression Labs Inc	9.63	0.13	1.3
OTC	11.88	5.13	Computer Network Tech.	11.88	1.38	14.5
OTC	14.50	7.50	Cross Comm	10.63	-1.00	-8.6
OTC	4.38	2.13	Data Switch Corp	4.31	0.03	0.7
OTC	50.63	38.13	DSC Communications (H)	50.63	3.88	8.3
OTC	41.75	14.13	FORE Systems Inc	31.00	5.25	7.1
NYS	15.88	9.25	General Datacomm Inds.	12.25	-0.13	-1.0
NYS	35.88	29.38	GTE Corp	35.88	1.00	2.9
NYS	120.13	77.00	ITT Corp	120.11	2.38	2.0
OTC	25.88	17.25	MCI Communications Corp	22.50	0.50	2.3
OTC	15.75	3.50	MICOM Communications Corp	7.30	0.88	13.5
OTC	16.88	6.00	Microcom Inc.	25.38	0.13	0.8
OTC	30.38	4.00	Netrix Corp.	8.50	-1.38	-18.8
OTC	9.00	3.75	Network Computing Devices	8.63	0.00	0.0
NYS	57.00	9.00	Network Equipment Tech.	25.75	2.25	9.6
OTC	30.63	14.25	Newbridge General	30.38	1.00	3.7
NYS	63.75	36.50	Newbridge Networks Corp.	36.50	1.13	3.2
NYS	41.00	25.00	Northern Telecom Ltd.	36.63	0.25	0.7
OTC	23.25	13.38	Novell Inc	19.13	-0.88	-4.4
NYS	45.13	35.63	Nynex Corp	40.81	0.38	1.2
OTC	35.00	15.75	Octel Communications Corp (H)	32.88	2.38	8.3
OTC	29.38	6.88	Optical Data Systems Inc	29.38	3.50	13.5
OTC	6.88	5.13	Redox Data Comm Networks	5.25	0.75	16.7
OTC	54.88	11.75	Picturetel Corp.	51.88	3.38	7.0
OTC	8.13	2.13	Proteon Inc.	6.75	0.63	10.2
OTC	7.25	2.75	Racotek Inc.	6.38	0.25	4.0
OTC	6.75	3.50	Retix	3.88	-0.11	-2.7
NYS	54.88	16.31	Scientific Atlanta Inc	23.00	1.00	4.5
NYS	47.00	39.25	Southwestern Bell Corp	40.88	-0.50	-1.1
NYS	40.13	35.88	Sprint Corp	37.75	0.13	0.4
OTC	31.25	12.38	Standard Microsystems Corp.	15.00	-0.25	-1.6
OTC	55.50	11.25	Stratacom Inc.	53.50	7.00	14.4
OTC	8.13	3.63	Telebit Corp (L)	3.94	-0.06	-1.5
OTC	524.00	75.00	US Robotics	124.00	12.13	10.8
NYS	93.13	34.63	US Westing	42.25	0.38	1.2
OTC	23.50	9.00	Xircom (L)	9.88	-0.57	-2.6
OTC	29.75	8.00	Xylogics Inc.	29.75	2.00	7.2
PC and Workstations						UP 4.2%
OTC	6.88	1.65	Advance Logic Research	6.19	0.38	6.5
OTC	30.94	26.38	Apple Computer Inc	47.65	0.81	1.7
OTC	19.25	30.38	AST Research Inc.	36.56	0.19	1.1
NYS	47.63	29.50	Compaq Computer Corp (H)	47.63	2.13	4.7
OTC	64.75	54.88	Dell Computer Corp	64.75	4.25	7.0
OTC	25.25	11.75	Gateway 2000 Inc	23.63	0.50	2.2
NYS	79.75	36.88	Hewlett Packard Co.	36.75	5.00	8.7
OTC	50.13	2.25	Micron International Inc	18.75	0.75	3.9
NYS	45.50	21.25	Silicon Graphics	43.38	1.38	3.4
OTC	53.38	20.88	Sun Microsystems Inc.	30.88	1.88	3.6
NYS	55.25	33.38	Tandy Corp	53.25	1.75	3.4
Large Systems						UP 4.6%
ASE	13.63	5.38	Amdahl Corp.	31.63	0.38	4.5
NYS	8.88	3.63	Convex Computer	4.50	0.13	2.9
OTC	0.22	0.16	Cray Computer	0.16	0.00	0.0
NYS	27.75	16.63	Cray Research Inc. (H)	57.25	3.38	13.8
NYS	12.00	8.75	Data General Corp	9.75	0.25	2.6
NYS	49.50	18.38	Digital Equipment Corp.	39.75	-1.13	-2.8
OTC	5.56	1.06	Encore Computer Corp	1.34	-0.31	-18.9
OTC	18.50	6.50	Harris Computer Systems Corp	11.88	1.38	10%
NYS	100.00	54.50	IBM	100.88	5.63	5.9
OTC	7.00	2.00	Meridian Data Inc.	5.75	0.25	4.5
OTC	32.75	9.25	Network Computing Devices	5.75	-0.13	-2.5
OTC	21.13	11.75	Sequent Computer Sys.	18.25	0.75	4.2
OTC	5.88	3.13	Sequoia Systems Inc.	5.25	1.19	29.2
NYS	39.88	25.75	Stratus Computer Inc	32.75	1.63	5.2
NYS	19.75	11.50	Tandem Computers Inc.	17.13	1.00	6.2
OTC	7.63	3.50	TriCord Systems (L)	3.38	0.00	0.0
NYS	12.13	8.25	Unisys Corp.	10.88	0.00	0.0
Software						UP 4.6%
OTC	60.50	27.25	Adobe Systems Inc	58.25	-0.50	-0.9
OTC	5.88	2.50	American Software Inc.	5.25	0.13	2.6
OTC	30.75	9.50	Apple Inc	27.11	1.88	7.4
OTC	53.00	24.63	Autodesk Inc	45.00	5.00	6.7
OTC	7.88	1.75	Bachman Info. Systems (H)	7.11	0.00	0.0
OTC	32.75	22.00	BGS Systems Inc (H)	32.13	-0.61	1.9
OTC	81.00	40.25	BMC Software Inc.	80.75	4.00	5.5
OTC	31.25	16.81	Boole & Babbage	30.00	-0.13	-0.4
OTC	14.38	6.00	Borland Int'l Inc	12.50	0.50	3.8
OTC	12.75	5.75	Brick Control Systems Inc	8.50	0.13	3.4
OTC	3.75	1.38	CE Software	3.38	-0.38	15%
ASE	20.00	7.75	Cognizant Software Inc.	19.88	0.25	1.3
OTC	31.25	8.25	Cognos Inc	25.38	0.13	0.5
NYS	73.63	37.50	Computer Associates	71.75	5.75	5.5
OTC	6.25	5.38	Computervision Corp (H)	6.63	0.00	0.0
OTC	49.25	21.88	Compuware Corp	30.75	7.00	6.1
OTC	21.75	9.00	Comshare Inc (H)	21.75	1.13	5.5
OTC	18.38	10.13	Cosmi Corp	18.38	1.51	7.6
OTC	10.25	7.75	Dataware Technologies Inc	13.63	0.38	5.8
OTC	2.88	1.88	Easel Corp	3.94	10.00	0.0
OTC	41.50	17.25	Filenet Corp (H)	40.75	1.38	3.9
OTC	8.75	3.88	4th Dimension	8.88	1.86	26.0
OTC	31.75	9.50	Frame Technology	28.25	-0.61	2.8
OTC	15.50	11.38	FTP Software Inc	30.25	0.25	0.8
OTC	25.50	7.25	Group I Software (H)	26.50	12.50	104.2
OTC	14.50	8.75	Gupta	8.88	0.25	2.6
OTC	11.75	6.63	Hogan Systems Inc.	10.50	0.00	0.0
OTC	50.75	31.75	Hyperion Software Corp	49.00	3.75	13.3
OTC	18.63	11.75	Information Resources	13.38	0.38	3.0
OTC	29.13	9.13	Informix Corp (H)	29.13	2.63	9.9
OTC	14.38	7.38	Integraph Corp	11.63	0.25	2.2
OTC	8.00	5.50	Interleaf Inc	7.88	0.50	6.8
OTC	24.63	8.63	Intersolv Inc. (H)	24.63	1.50	6.5
OTC	86.25	33.75	Intuit Inc.	77.75	4.00	5.4
OTC	47.00	19.00	Legent Corp	45.00	0.88	2.0
OTC	64.13	24.00	Lotus Development	47.00	0.00	0.0
OTC	13.38	9.63	Magic Software Enterprises	11.13	2.13	23.6
OTC	15.63	6.75	Management Graphics Inc (H)	13.63	1.38	8.6
OTC	40.00	14.75	Mapinfo Corp	38.75	1.88	5.0
OTC	8.38	1.44	MathSoft	5.31	0.38	7.7
OTC	35.25	6.75	McAfee Associates	29.00	-1.75	-4.1
OTC	18.50	9.38	Newton Graphics	18.00	0.50	4.0
OTC	16.63	10.75	Micro Focus	12.38	0.38	3.1
OTC	9.75	4.63	Microgrammx Inc	8.50	0.38	4.6
OTC	95.13	60.88	Microsoft Corp	95.13	4.56	5.0
OTC	22.38	3.63	NetManage Inc	16.63	0.65	3.6
OTC	60.50	53.06	Oracle Corp	60.00	0.00	2.1
OTC	50.38	22.25	Parametric Technology	38.13	0.13	0.3
OTC	24.25	7.88	Peachtree Systems Inc (L)	8.25	0.00	0.0
OTC	59.50	15.75	Peoplesoft	38.50	9.00	8.2
OTC	12.11	4.38	Phoenix Technologies (H)	11.75	1.25	23.9
OTC	16.88	5.50	Platinum Software	15.69	0.81	5.5
OTC	25.25	12.75	Platinum Technology	19.13	1.00	5.5
OTC	59.50	28.00	Progress Software Corp	53.13	0.63	1.2
OTC	13.00	1.88	Quarterdeck Corp	10.75	-1.13	-9.5
OTC	25.13	9.38	Rainbow Technologies Inc	23.88	1.88	8.5
OTC	7.13	2.00	Rasterops	6.25	0.63	11.1
OTC	6.13	5.88	Ross Systems	5.50	0.38	7.4
OTC	12.00	0.50	Saitech Inc. Corp N.V	5.00	0.00	0.0
OTC	32.13	11.50	Softkey International Inc	31.38	-0.63	-2.0
OTC	6.25	2.88	Software Publishing Corp	3.27	0.57	7.6
OTC	15.50	6.25	State of the Art	9.38	-0.25	-2.6
NYS	40.13	25.00	Sterling Software Inc	40.13	1.63	4.2
OTC	15.00	3.63	Struct Dynamics Research	11.25	-1.75	-13.5
OTC	55.00	19.00	Sybase Inc	32.00	2.75	9.4
OTC	50.00	11.13	Symantec Corp	36.50	5.00	-5.2
OTC	63.25	34.75	SynOptics (H)	62.75	0.50	0.8
OTC	80.00	50.63	System Software Assoc.	51.88	1.88	9.6
OTC	7.75	3.75	Teradic Corp	6.00	0.13	2.1
OTC	26.00	7.88	Visual Logic Systems	12.38	0.25	2.0
OTC	52.00	10.75	Wall Data Inc	30.31	1.38	14.1
OTC	30.75	4.63	Walker Interactive Systems	5.88	-0.22	-3.6
OTC	55.00	55.00	Wall Data Inc	55.00	0.50	-3.2
OTC	18.25	9.53	Wang Laboratories Inc.	10.75	0.18	1.5
Semiconductors						UP 5.4%
NYS	39.75	25.25	Advanced Micro Devices	30.88	0.38	1.4
NYS	35.63	16.88	Analog Devices Inc	15.63	1.00	6.8
OTC	50.88	21.88	Atmel Corp	38.88	4.38	7.0
OTC	14.88	3.63	Chips and Technologies	13.56	0.38	2.9
OTC	48.63	21.00	Cirrus Logic	38.63	4.88	7.6
NYS	46.00	15.00	Cypress Semiconductor Corp	46.00	4.63	12.2
OTC	22.38	13.38	Dallas Semiconductor	21.38	1.13	5.5
OTC	39.25	18.00	Integrated Silicon Systems (H)	38.25	2.25	6.1
OTC	67.63	38.06	Intel Corp	67.63	5.00	8.0
NYS	46.88	11.81	LSI Logic Corp	38.88	6.25	18.8
OTC	37.13	15.50	Lattice Semiconductor	37.00	5.38	4.0
NYS	49.25	35.75	Micron Technology	46.50	2.13	3.0
NYS	30.38	44.00	Motorola Inc (H)	70.50	5.25	6.1
NYS	28.25	14.25	National Semiconductor	28.88	1.00	3.6
OTC	53.88	8.00	Sierra Semiconductor (H)	51.88	0.56	1.1
NYS	144.00	81.38	Texas Instruments	140.75	4.75	3.5
OTC	31.63	10.25	VLSI Technology	11.69	1.69	5.4
OTC	5.25	1.38	Weitek	4.75	0.38	8.6
ASE	51.75	13.13	Western Digital Corp	38.38	0.75	4.3
OTC	106.25	38.38	Xilinx	106.25	7.75	8.0
OTC	37.25	37.25	Zilog Inc	37.25	0.00	0.0
Peripherals and Subsystems						UP 3.6%
OTC	25.88	14.38	American Power Conversion	24.63	1.00	4.2
OTC	39.88	10.25	Adaptec Inc	30.13	2.00	5.4
OTC	27.25	16.75	Barclec Inc	19.75	0.00	0.0
OTC	12.00	3.38	Cambex Corp (H)	11.63	0.63	5.7
ASE	4.25	2.38	Countrotech Corp	3.38	0.25	7.7
NYS	14.25	9.00	Conner Peripherals	13.25	2.00	8.2
OTC	14.00	7.50	Creative Technologies Inc	8.56	-0.94	9.9
OTC	13.13	5.50	Data Race Inc	11.50	0.00	0.0
ASE	7.63	4.25	Databank Corp	6.00	0.25	14.3
NYS	25.88	13.75	EMC Corp	23.88	1.75	5.1
OTC	26.13	6.50	Emulex Corp (H)	26.13	1.75	7.2
OTC	17.75	11.25	Evans & Sutherland	14.13	-0.38	2.1
OTC	24.00	11.75	Exabyte	19.38	1.25	6.8
OTC	8.63	1.88	Intelligent Info. Systems	3.13	0.25	7.4
OTC	26.13	1.38	Iomega Corp	24.00	+1.63	7.3
OTC	6.75	2.88	IPL Systems Inc	8.25	0.00	0.0
OTC	55.13	18.63	Komag Inc	53.13	2.25	4.3
OTC	7.29	2.63	Maxtor Corp	5.75	-0.50	-8.0
OTC	13.50	4.00	Micropolis Corp	5.75	0.50	9.5
OTC	16.75	8.75	Pinnacle Micro Inc	11.00	0.00	0.0
OTC	28.75	7.38	Pyramid Inc	27.25	0.38	1.4
NYS	10.75	5.88	QMS Inc (L)	9.88	0.13	1.4
OTC	26.63	11.00	Quantum Corp	24.63	1.38	5.9
OTC	15.00	7.38	Radius Inc	12.50	1.38	12.6
NYS	9.63	6.38	Recognition International	9.00	0.00	0.0
OTC	7.00	1.63	Reynolds	4.38	-0.25	5.4
OTC	63.63	51.50	Seagate Technology	62.25	2.75	7.0
NYS	19.13	17.88	Storage Technology	29.38	0.63	5.8
NYS	58.50	28.50	Tektronix Inc (H)	30.38	0.00	0.0
NYS	135.00	80.63	Xerox Corp	135.00	8.25	7.3
Services						UP 4.3%
OTC	26.88	16.31	American Mgmt Systems (H)	26.63	1.00	7.6
NYS	5.38	0.56	Analytics Inc	0.88	0.00	0.0
NYS	27.75	14.38	Analysts Int'l	26.75	0.00	0.0
NYS	86.00	50.75	Automatic Data Processing	61.88	0.75	1.2
OTC	16.75	16.00	Cambridge Tech. Partners	31.00	0.00	0.0
NYS	32.88	21.50	Ceridian Corp (H)	30.00	1.00	5.6
NYS	10.88	10.13	Comdisco Inc	10.75	-0.13	1.2
OTC	18.88	5.06	Computer Horizons	10.00	2.00	25.0
NYS	57.75	39.75	Computer Sciences (H)	56.38	0.63	1.1
NYS	15.00	9.38	Computer Task Group (D)	16.75	1.00	7.3
NYS	31.63	8.75	Compusa Inc	25.13	0.00	0.0
OTC	10.75	5.38	Control Data Systems Inc	8.13	0.25	2.9
OTC	14.75	9.13	Edmark Discovery Software (H)	14.13	5.13	0.7
NYS	65.25	53.00	General Motors E (D) (S)	65.25	3.13	2.5
OTC	14.25	6.50	Hogan Corp	12.88	0.00	0.0
OTC	18.38	7.38	Intelligent Electronics	14.44	0.81	6.0
OTC	11.25	3.88	Metrisec	8.13	0.13	1.5
OTC	38.00	9.38	Microdyne Inc	14.56	0.38	2.6
OTC	38.25	19.38	Paychex	38.25	1.25	3.4
NYS	31.63	22.25	Policy Management Sys	40.13	1.88	4.1
NYS	31.38	22.25	Reynolds and Reynolds	31.38	1.88	6.4
OTC	24.13	16.75	SEI Corp (H)	24.13	1.63	7.2
OTC	31.50	22.75	Shared Medical Systems	41.38	1.38	3.4
OTC	8.00	6.00	SHL Systemhouse	7.75	0.94	12.3
OTC	21.50	11.50	Software Spectrum Inc	20.25	-0.81	3.8
OTC	36.75	12.75	Surgical Data Systems	16.25	4.00	7.8

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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Drug errors show need for IS Rx

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breast cancer patient.

"We need to do a much better job in clinical decision support," said Larry D. Grandia, vice president of IS at Intermountain Healthcare, Inc. in Salt Lake City. He said he read the study and found it "pretty accurate in the sense that physicians are largely left to their own understanding of drugs, dosages and patient conditions."

> "There is very little argument that health care has been pretty far behind other industries in terms of automation"
>
> — Simon Cohn, coordinator of clinical IS, Kaiser Permanente Health Plan

Many hospitals have pharmacy systems that warn of drug interactions, but experts said few hospitals have complete electronic patient records or automated alerts that help doctors make better decisions when the drug order is first placed. That is the stage at which most errors occur, the study found.

Resistant to change

The technology has existed for 20 years but has not been broadly implemented for various reasons, a half dozen health care IS executives and consultants said last week. They cited factors such as cost, doctors' resistance to automation, difficulties in replacing legacy systems and software vendors' focusing more on accounting systems than medical support.

"There is very little argument that health care has been pretty far behind other industries in terms of automation," said Simon Cohn, coordinator of clinical IS at Kaiser Permanente Health Plan, Inc. in Oakland, Calif. But he said the giant health maintenance organization, which has more than 6.6 million subscribers, is moving aggressively to implement the recommended systems in the next few years.

Intermountain Healthcare has a partial solution today, in which doctors' orders are keyed into a rules-based system that then interrogates the patients' electronic medical record about allergies, vital signs and laboratory results. The pharmacist then reports any "alerts" to the prescribing doctor, Grandia explained.

The expert system, called HELP, runs on Tandem Computers, Inc. fault-tolerant mainframes. It is now marketed by 3M Co.'s 3M Health Information Systems unit in Salt Lake City and costs $2 million to $5 million, depending on configuration.

Brigham and Women's Hospital in Boston has gone a step further. It installed a client/server system this year that doctors use for real-time advice as they create the drug order. For example, it reduces the doctor's number of choices by showing only acceptable doses and frequencies; this is considered one of the best ways to eliminate mistakes.

The study, which included medication errors made at Brigham and Women's before the new system was completed, said the physician order-entry system has the potential to sharply reduce errors.

Of course, human errors can still creep into computer systems. The Harvard study noted that although most erroneous drug orders were handwritten, 12% were entered by computer.

The next big challenge will be to reduce information overload, which is when the system provides too many alerts or reminders.

For example, some drug-interaction systems "constantly beep at the pharmacist with insignificant interactions, so they are ignored or turned off," said Lawrence Pawola, senior vice president of Sheldon I. Dorenfest Associates Ltd., a Chicago-based health care IS consultancy.

A matter of life or death

The Top 5 systemic failures that lead to medication errors:

1. Doctors lack sufficient patient information to select the proper drug, dosage and frequency.
2. The pharmacy and nurses fail to distinguish between look-alike packages and sound-alike names for drugs.
3. Clinicians lack information about a patient's condition, recent laboratory tests, current medications and recent doses.
4. Manually transcribing prescriptions onto medication sheets leads to errors because secretaries lack medical training and physicians' handwriting is often illegible.
5. Patients receive drugs for which they have known allergies because records are not always available when clinicians need them.

Source: Journal of the American Medical Association, Chicago

OS/2 counteroffensive

To counter the dominance of Microsoft Office, IBM/Lotus is considering a plan to plant Lotus' SmartSuite firmly in a high-end market position where it would directly compete against Office and Novell's PerfectOffice.

IBM would separately pursue a low-end suite product. Sources within IBM said the company is considering a low-end offering called IBM Office.

Due in December, IBM Office is expected to comprise various IBM technologies, including Installer, Visual Age, a translation program called LanguageWare and speech-recognition technology as well as StarOffice, a group of productivity applications IBM licensed in March from Star Division GmbH in Hamburg, Germany, sources said.

In the meantime, IBM will likely ship next month StarOffice 3.0, which will initially run on OS/2, Windows 3.1 and Windows NT. Mac OS and AIX versions are slated for the end of the year, sources said.

IBM/Lotus is also looking at bundling Lotus applications with OS/2, using jointly developed technology that would make OS/2 and Windows applications more compatible. The company may also integrate OS/2 and Windows applications in a single offering by year's end.

Some industry watchers claim that IBM's two-pronged strategy is unlikely to impact Microsoft Office. "SmartSuite is a significant product, so if IBM comes out with an alternative insignificant product, it wouldn't change the situation in the market," said Jeffrey Tarter, editor of "Soft Letter" in Watertown, Mass. — *Lisa Picarille*

Microsoft

CONTINUED FROM PAGE 1

will ship Office 95 a month earlier than planned, synchronizing the ship dates of Office 95 with Windows 95 on Aug. 24.

By comparison, Novell, Inc. plans to deliver the Windows 95 versions of its PerfectOffice applications suite by year's end. Meanwhile, Lotus Development Corp. has issued contradictory ship dates for its Windows 95 suite version.

Users watching training and migration costs heralded the closing of the gap between Office 95 and Windows 95 availability.

"When they cut a month off their Office 95 delivery schedule, it cut our training and support launch cost significantly. We've been yelling for it, and they've responded," said Briscoe Stephens, coordinator of Advanced Science Information Systems at NASA's Marshall Space Flight Center in Huntsville, Ala.

"The availability of Office 95 with Windows 95 will make our conversion to 32-bit applications less complicated than if we had had to stagger them. This will allow us to do a larger installation of Office 95 than we anticipated," said Theresa Dolbert, vice president of implementation and business services at Kelly Services, Inc. in Troy, Mich.

Other beta users of Windows 95 and Office 95 said the corporate licensing discounts for early adopters, along with the simultaneous Office 95 and Windows 95 ship date, is Microsoft's response to corporate user requests.

"With Windows 95 and Office 95, Microsoft has shifted its focus from being end-user-oriented to giving the IS director more control over the software implementation and administration process. Now IS directors won't have to justify rolling out Windows 95 without the applications to back it," said Kelly Dwyer, global information technology director at Braxton Associates in Boston.

Also attractive to IS, suite pricing for Windows 95 products promises to be competitive. A Novell spokeswoman said the Windows 95 release of PerfectOffice is likely to be priced in line with the current version, which costs $649 for the standard version and $859 for the professional release.

However, Novell is running a summer promotion whereby users who purchase the current Windows 3.1 version of PerfectOffice before Oct. 1 receive a $50 rebate on the Windows 95 version. Given the upgrade prices for PerfectOffice — $259 (standard) and $359 (professional) — the rebate would bring the cost of PerfectOffice in line with Office 95 pricing.

Buy now, save now

The retail pricing for Microsoft's Office 95 includes Word, Excel, PowerPoint and Schedule Plus.

Full package product:
Standard – $499
Professional* – $599

Introductory upgrade price for competitive products until year's end:
Standard – $249
Professional* – $349

Microsoft customer upgrade:**
Standard – $209
Professional* – $309

Jan. 1 upgrade price:
Standard – $299
Professional* – $399

* Includes Access database
** Includes a $40 rebate

Incentive program

Microsoft also confirmed last week plans to launch on July 15 two Office 95 marketing programs designed to encourage conversion to the 32-bit platform.

A program called Coming Soon will enable retailers and resellers to begin previewing and reserving advance copies of Windows 95 and Office 95 at their business sites. The Technology Guarantee program will qualify buyers of Office 4.x for an upgrade at no charge until Dec. 31, said Dennis Tevlin, Microsoft group product manager of desktop applications. Those who purchase Windows 3.1 between July 15 and the Aug. 24 launch of Windows 95 can upgrade to Windows 95 for $50, said Yusuf Mehdi, Microsoft's Personal Systems Division product manager. — *Cheryl Gerber*

PC system helps court defy odds, gives offenders a second chance

In New York, the Midtown Community Court computer system is changing legal proceedings, and courts across the country are watching to see how much impact it will have.

I had seen the PC-based application at Comdex/Spring '95 in Atlanta, where it won the "government" category in the Windows World Open contest. But seeing it in action was different.

As you walk into the courtroom, you are greeted by a monitor that looks like an oversized arrivals screen at an airport. It shows whose case is before the judge, the charge and the lawyers involved, thus answering the first set of questions that a defendant's friends and family have when they attend an arraignment.



With the click of a mouse, the system updates the judge on a defendant's compliance with community service.

Charles Babcock

After taking a defendant's plea, the judge consults a wide scope of background information available through the Windows application — not only the prior arrest record but also the degree of drug abuse, homelessness and health problems. The judge can click on a beaker icon to get the results of a urinalysis test. If the beaker is green, the judge knows the test was negative.

A high percent of misdemeanor defendants — 64% — are given community service sentences, and with the click of a mouse, the system keeps the judge up to date on a defendant's compliance.

Possibly because of that watchfulness, fulfillment of community service is high, 72% to 77%. In the centralized courts downtown, community service is used as a sentence in only 26% of the cases, and compliance rates are only 50%.

But the real change wrought by the computer system is to activate links between the offender and the neighborhood. Prearraignment interviewers using handheld computers question defendants about their backgrounds, previous offenses, drug dependencies, job status and housing needs. The data is put on-line to 45 PC workstations for the judge, court workers, lawyers and social service referral agents, said John Feinblatt, designer of the system.

If a prostitute pleads guilty, she is sentenced to community service and a group session on the health risks and other dangers of her trade.

"Misdemeanors are not very complicated cases, but they are committed by people with complicated lives," Feinblatt says.

The computer system supplies the arresting officers with the outcome of the case, "feedback that is almost unheard of except in small towns," he says.

Offenders typically are sentenced to sweep streets, paint over graffiti, stuff envelopes for nonprofit organizations and sort recyclable cans. They wear vests stenciled with "Community Court," so the neighborhood sees them at work.

Prior to October 1993, a prostitute arrested in Times Square would be booked downtown, held in jail overnight and arraigned the next day, only to have the case dismissed for the "time served" in jail.

At Midtown Community Court, defendants are held in air-conditioned rooms without bars. After their interviews, their cases quickly move to arraignment, with waiting times reduced from 36 hours to 18 hours. If sentenced, offenders are brought to social services and often begin serving their sentence the same day.

By promising swift justice, the court gets the defendants' undivided attention. While it has their attention, it proposes remedies to problems that could lead to more serious offenses.

The Midtown Community Court is being watched by the National Association of Court Management, which gave it the Justice Achievement Award last year. Can a combination of technology and service reduce the rate of recidivism?

The Windows system indicates that where judges are willing, technology opens lines of communication and helps match offender needs to services. And the networked system offers the hope of decentralizing courts and putting justice closer to the neighborhood.

Technology is feared for its controlling aspect, and this application clearly extends control over offenders. But in this case, technology also serves as a door opener and creator of opportunities that might otherwise be missed.

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Inside Lines

NEC note

NEC Technologies is getting set to unwrap an addition to its high-end Versa series of notebooks. According to sources, the system based on the Intel Pentium is a highly modular design that will allow users to swap a floppy drive with a full-fledged quad-speed CD-ROM drive or an additional battery pack. It offers a choice of both a 10.4- and a 9½-in. active-matrix monitor with a resolution of 640 by 480 pixels, standard 8M bytes of RAM, 500M bytes of hard disk space and built-in audio.

Hands across the net

Microsoft will end months of speculation this week by announcing that it will develop a Windows NT Server client redirector for Novell's NetWare 4.1 platform, sources close to the company said. Novell, meanwhile, will finally bow to user pressure and add support for log-in scripts to its Client Requester for Windows NT Workstations via the on-line forums "by the end of September," according to senior product manager Dawn Drake.

Hub-ba, Hub-ba

Asante Technologies this week will announce what it bills as the first stackable "fast" Ethernet hub. The AsanteFast 100 Hub is a 12-port device that can support 100M bit/sec. of Ethernet bandwidth on each port for so-called "power workgroups." Five units can be stacked together using an expansion card that transmits signals among units. An RJ-45 backbone port enables users to connect three stacks for a total of 118 ports. The stackable hub will ship next month at $1,995 per unit.

It keeps growing and growing and . . .

EMC is beta-testing an upgrade of its Symmetrix 5500 mainframe disk array, which reportedly pumps up capacity from 1T byte to 1.6T bytes. The bulked-up box replaces the 5½-in. disk drives with 3½-in. drives — 384 of them in the most shirt-popping configuration. Shipments are supposed to start later this year, sources said.

If a tree falls in the woods . . .

If a four-fiber, bidirectional Synchronous Optical Network ring gets cut by a backhoe between Anaheim and San Diego and nobody notices, did it really happen? Sprint is facing that existential dilemma as it tries to score points for its network recovery system, which rerouted telecommunications traffic in 50 milliseconds following a recent line cut . . . or so the company says.

Fore!

ATM market leader Fore Systems will this week announce a high-end ATM workgroup switch that can be configured to support 16 ports, each capable of delivering 155M bit/sec. of bandwidth. The new switch will use the Intel 1960 processor-based architecture that its current ASX-200BX and ASX-200BXE ATM switches use. The switch can be set up to support other configurations, Fore Systems confirmed the data.

Plays well with others?

Cisco is expected to this week firm up its access product strategy with an announcement that analysts speculate will let its many network access products play better in IBM networking environments. "Such an enormous chunk of their total revenues come from IBM networks that they'll have to focus on adding on features such as frame relay, Data Link Switching and APPN," said one wag.

Squealers go on-line. . . . This industry rumor thing has gone legit. Investigative consulting firm Decision Strategies International in New York launched an Internet-based hot line service last week called TipNet to gather info about crimes such as product tampering, counterfeiting and intellectual property piracy. Within two hours, technically literate informants who fear exposure by phone can instead send anonymous or encrypted E-mail to a designated account. You can find out about TipNet at http://www.tmn.com/dsi/index.html or you can report such crimes as buggy software, sloppy support and unbaked products to us here at Computerworld by calling our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474.

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